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OCTOBER 2008

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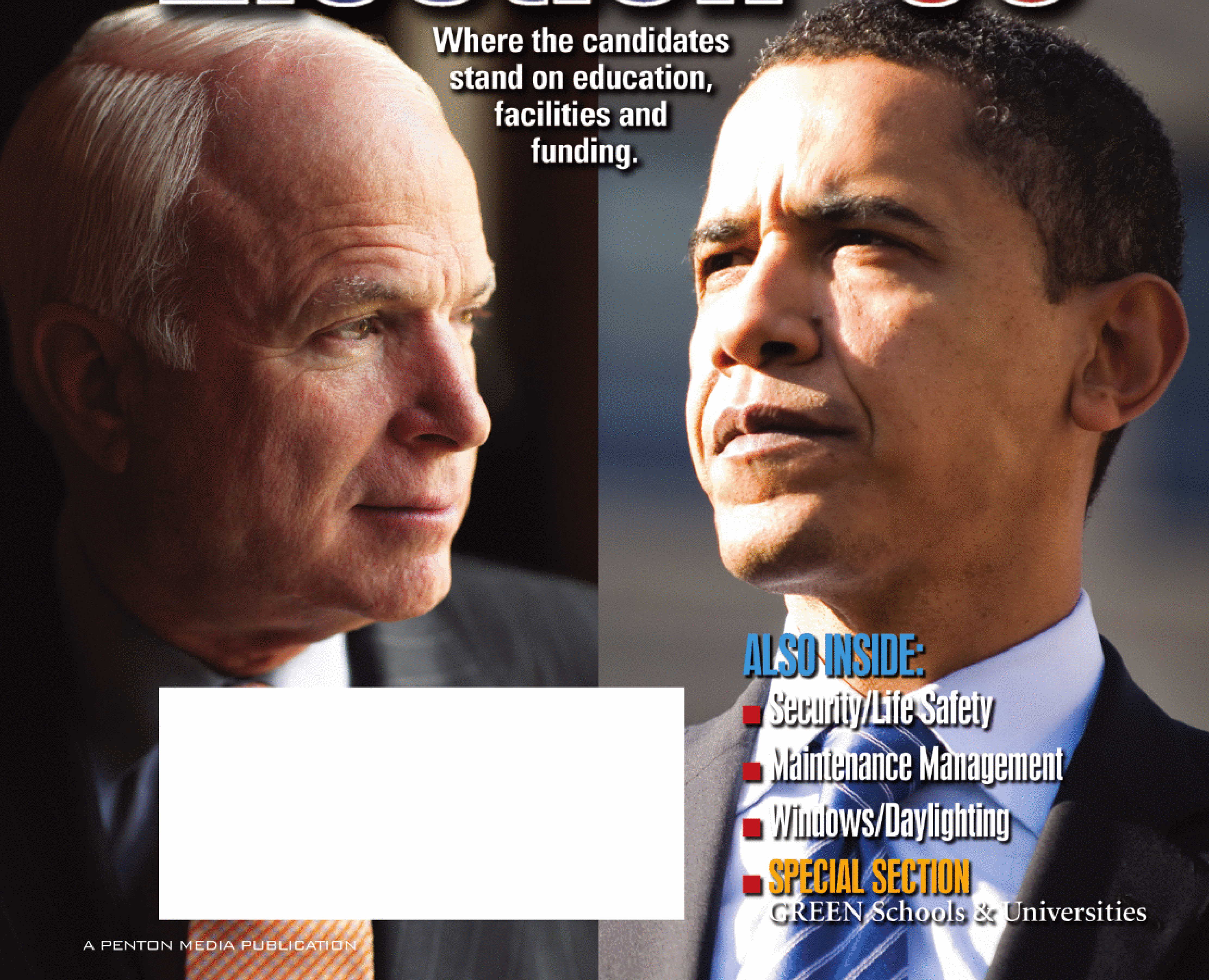

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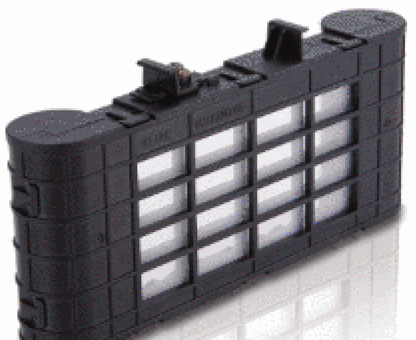

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SHAPING FACILITIES & BUSINESS DECISIONS
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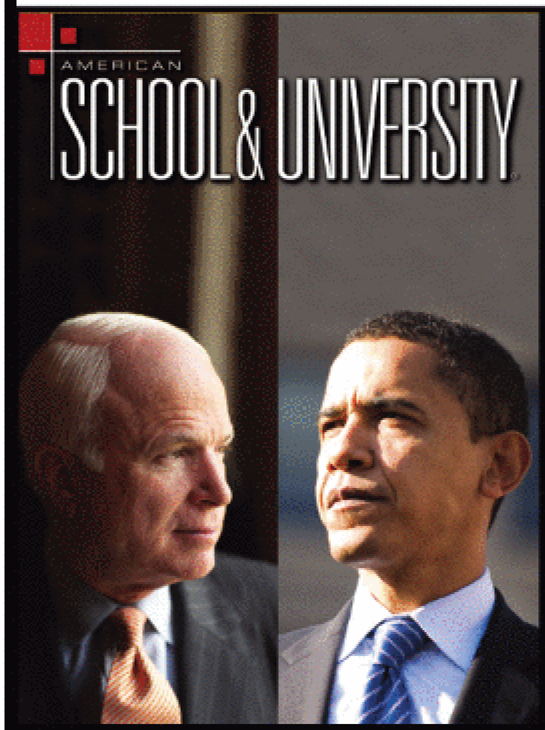

On the Cover: 2008 presidential candidates John McCain and Barack Obama. McCain photo courtesy of John McCain 2008/JohnMcCain.com

Save the Dates

AS&U announces entry dates for the 2009 Educational Interiors Showcase and Architectural Portfolio: EIS 2009 entry forms due **March 4**, portfolios due **April 3**. AP 2009 entry forms due **June 3**, portfolios due **July 3**.

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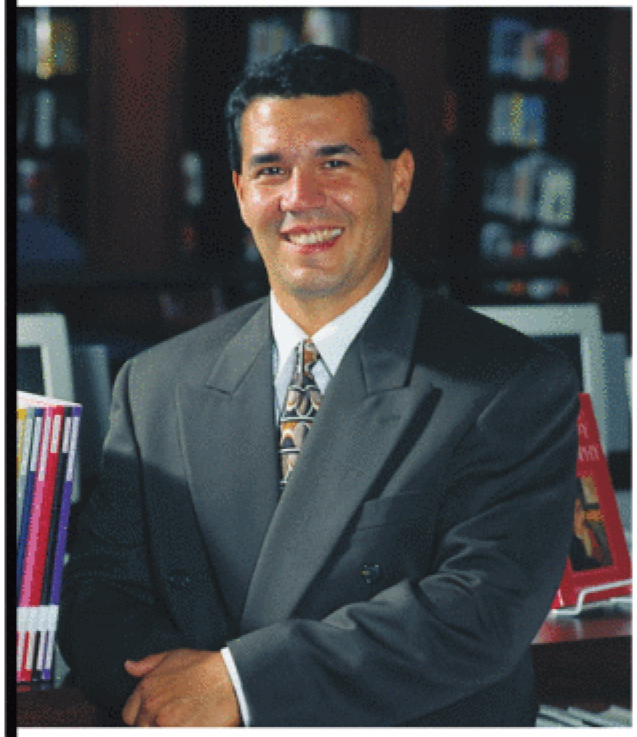
Missing in Action



Once a cornerstone of presidential campaigns, education finds itself at the back of the class in this year's election, as the economy, foreign policy, energy and other issues dominate the discussion.

But even though education currently is not sharing the spotlight, there is little doubt of its importance to voters and the nation as a whole. In this month's cover story, *American School & University* examines the candidates' platforms and plans for improving education in America (see p. 18).

In reviewing the candidates' education platforms, substantive details are lacking. Sen. McCain offers few specific proposals, focusing more on philosophical statements; Sen. Obama proposes a number of programs, offering specific details on some. Among the proposals: Sen. McCain wants more school choice; Sen. Obama proposes doubling federal aid to charter schools. Of course, the fate of No Child Left Behind looms on the horizon for whoever the next president is, as general dissatisfaction with the program in its present form leaves its future in jeopardy.

In regard to facilities funding, not much is being proposed by either candidate. As part of Sen. Obama's Emergency Economic Plan, $25 billion would be available in a Jobs and Growth Fund to, among other things, fund new "fast-tracked" projects to repair schools. No mention of education facilities appears in Sen. McCain's proposals. The focus on education facilities as part of national debate historically has been a partisan issue; Democrats stress the need to provide federal funding to construct and repair school facilities, while Republicans maintain facilities are a state and local issue.

As we approach the final days prior to what promises to be an historic election, education proponents will have to remain patient as other issues are addressed over the near term. However, education is a priority for most Americans, and it won't be long before it regains its prominence as a key focus of national dialogue. ■

jagron@asumag.com

WEB 101

Financial matters

Money talks, but right now everyone's talking about money. There's trouble all around. A recent discussion on our blog addressed the financial condition of the Milwaukee school district; last month, school board members voted 6 to 3 to consider dissolving the district.

Some board member comments:

- "We have ample evidence the current model is going to move us to ruination sooner or later."
- "Structurally, financially, we're in an untenable situation."

The blog question: Would dissolving a district, especially a large, urban system such as Milwaukee, be an effective way to address financial and management problems and improve student academic performance?

What do you think? Are you worried about your own finances and too busy to think about school finances, or are you concerned?

Visit the blog via our homepage at asumag.com or directly at http://blog.asumag.com/schoolhouse_beat and let us know.—*Susan Lustig*

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INSIDE: ACCESSIBILITY

University of Michigan, Ann Arbor.
Photo courtesy of U-M Photo Services

ADA SETTLEMENT FOR BROWN MACKIE CAMPUSES

In a settlement with the U.S. Justice Department, the Brown Mackie College system has agreed to improve accessibility for the disabled on 19 U.S. campuses. The for-profit system focuses on career education and is owned by Education Management Corp.

The settlement calls for the schools to comply with the Americans with Disabilities Act by removing architectural barriers from its facilities. Brown Mackie leases all of its campus buildings, the Justice Department says.

Among the violations that are to be corrected on Brown Mackie sites: doors that are too narrow; round doorknobs; inadequate space for maneuvering wheelchairs near doors; abrupt level changes along required routes; steep ramps; inaccessible toilet rooms; water fountains with spouts that are too high; and lack of accessible visual fire alarms.

ACCESSIBLE SEATING ADDED AT MICHIGAN STADIUM

When the University of Michigan Wolverines opened the football season in August, the school's stadium in Ann Arbor had space to accommodate more than 180 wheelchair users and their companions.

The additional accessible seating was installed in the 108,000-capacity facility as part of a settlement of an accessibility lawsuit brought by the Michigan Paralyzed Veterans of America. The school was carrying out a $226 million renovation of the stadium, and the veterans group contended that the planned upgrades violated the Americans with Disabilities Act because they did not include enough seating for those with disabilities.

After the U.S. Justice Department joined the suit on behalf of the disabled veterans, the university agreed in March to settle the case.

Michigan has agreed that by 2010, the stadium will have more than 300 pairs of seats for wheelchair users and their companions. The university also will add accessible parking, improve inaccessible toilet rooms, and provide accessible routes to and throughout the stadium, the Justice Department says.

SCHOOL CAMP WILL WELCOME CHILDREN WITH DIABETES

The Raynor Country Day School, a private school in Westhampton, N.Y., has agreed to make the programs at the school and its summer camp accessible to children with diabetes.

The U.S. Justice Department says the school has agreed to accept children with diabetes in both the school and summer camp programs, and agreed to supervise students who are monitoring their blood sugar and insulin intake using insulin pumps.

The federal department became involved after two families had alleged that their children were not allowed to attend the summer camp. The parents asserted that their children were admitted to the summer camp initially, but after the school learned of their use of insulin pumps, they were told they could not attend. ■

DATA ON DISABLED

Percentage of students ages 3 to 21 served under the Individuals with Disabilities Education Act (IDEA), 2006-07

All disabilities	13.5%
Specific learning disability	5.4%
Speech or language impairment	3.0%
Mental retardation	1.1%
Emotional disturbance	0.9%
Hearing impairment	0.2%
Orthopedic impairment	0.1%
Other health impairment	1.2%
Multiple disabilities	0.3%
Autism	0.5%
Traumatic brain injury	0.1%
Developmental delay	0.7%

Source: National Center for Education Statistics, "The Condition of Education 2008"

Our assignment for the school project: the [air]

This illustration highlights the various Greenheck products available for school buildings; it does not represent an actual ventilation application.

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Arts education

The four-story, 49,000-square-foot Humanities & Technology Building at Palm Beach Community College, Boca Raton, Fla., creates a gateway to campus.

Sweeping, curved panels highlight the building entrance; monolithic walls are punctuated with whimsical blocks of color; and the two stair towers are expressed either through an exposed arrangement or behind a glass curtainwall. Creative ceiling treatments and an infusion of natural light enhance interior spaces.

The building includes state-of-the-art technology in multidimensional classrooms, studios and labs, as well as theater and music appreciation, plus two Socratic teaching classrooms, computer labs and display areas.

A circular garden acts as the link between the existing campus and the new humanities building, which has a radial plaza emanating from the center. This outdoor plaza serves as a living classroom and gallery for student lectures and projects.

The architect is STH Architectural Group, Inc. (West Palm Beach, Fla.)

Palm Beach Community College, Humanities & Technology Building, Boca Raton, Fla. Photo courtesy of New York Focus LLC

Sierra Canyon School, Science and Humanities Classroom Building, Chatsworth, Calif. Photo courtesy of Oe/Ueda Studio

Academic village

The Science and Humanities Classroom Building at Sierra Canyon School, Chatsworth, Calif., has been completed. Construction on the first phase of this five-acre master plan began in August 2006. Once completed, the project will be the first non-sectarian independent school for seventh through 12th grade in the San Fernando Valley in 50 years. In addition to the classroom building, the master plan calls for an athletics complex, performing-arts center, administration building and dining commons.

The three-story, 53,000-square-foot classroom building contains a variety of academic spaces, including 23 classrooms—each designed to serve 20 students; a student-life center; a 20,000-volume library space; fine-arts studios; a dance studio; photo lab with darkroom; and an 11,000-square-foot science wing with a lecture hall and six college-level working labs. The dramatic, curving facade of the building follows the line of the street, forming a protective perimeter for the interior plaza, and shielding the campus from traffic noise.

The building integrates environmentally sensitive components and building features. South-facing elevations are shaded with a continuous perforated aluminum sunscreen, and the majority of classrooms are accessed via exterior corridors. All windows feature 1-inch-thick, insulating, dual-pane glass and have operable panels. Fluorescent lighting is governed by motion sensors that turn lights off when rooms are not in use.

The architect is Parallax Associates, Inc. (Culver City, Calif.)

Start: August 2006
Completion: September 2008
Project area: 53,000 sq. ft.
Cost: $23.5 million

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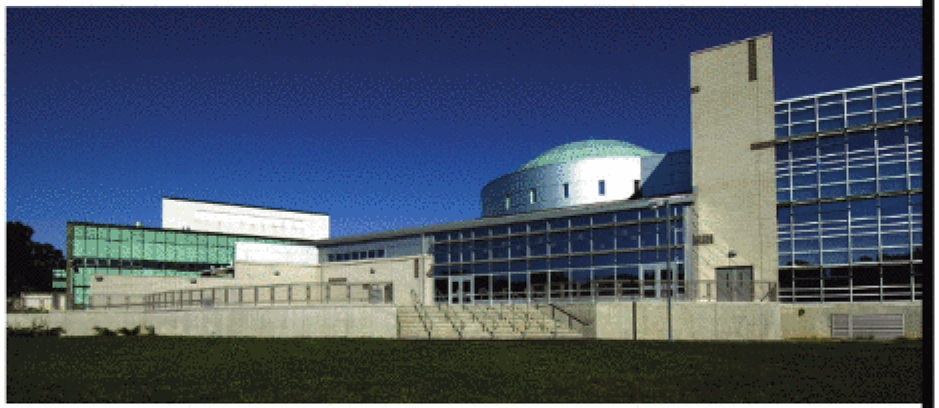
High-tech high school

The Academy of Information Technology & Engineering (AITE), Stamford, Conn., is a college-preparatory public high school that engages students in curricula enriched by information technology resources.

Every section of the school can be used as a teaching area. Movable lecterns, wireless technology, shared overhead projectors and more allow students and teachers to collaborate. Additionally, the atrium can be used for recreation or instruction. Technology-rich features include the most current zoned wireless system, a fiber-optic ring; eChalk boards; and shared print and laptop storage/recharge drawers.

The school features energy-saving technologies, such as a thermal and ice storage system that harvests and stores energy during low-demand evening hours for use during the daytime, and sun-shading devices on its large



Academy of Information Technology & Engineering, Stamford, Conn. Photo courtesy of Joseph Fuller

window systems. Advanced materials such as ground-face, insulated block; an aluminum curtainwall system with high-performance glass; insulated metal panels; and a 60-foot diameter translucent dome over the media center and teacher work room, ensure energy efficiency as well.

The architect is Fuller and D'Angelo (Elmsford, N.Y.).

East Ridge Middle School, Clermont, Fla.

New school

East Ridge Middle School, Clermont, Fla., is a new $41.6 million, 169,942-square-foot school for 1,414 students.

The facility includes a three-story classroom building; three-story media center and science building; a three-story bridge spanning the courtyard, connecting the classroom and media/science buildings; 39 classrooms and six resource rooms; a music suite with four practice rooms, along with band, vocal and ensemble rooms; a 25,500-square-foot dining/multipurpose space with an open stage; a gymnasium; four vocational labs; and administration offices. The project was completed in July 2008.

In 2007, this design won an "Award of Merit" from the American Institute of Architects, Orlando chapter.

The architect is SchenkelShultz Architecture. (Orlando). The construction manager is PPI Construction Management, Inc. (Orlando)

Accessible parking

As space became tight and parking difficult, facility managers at Santa Rosa Junior College, Santa Rosa, Calif., decided to build a new parking structure on campus. Featuring five levels above ground and one level below ground, the cast-in-place, post-tensioned, 378,220-square-foot concrete structure has 1,081 parking spaces.

The parking structure was constructed with red weathered brick to keep it consistent with the character of the local area. A clock tower is at the northwest corner of the building.

The parking garage goes above and beyond the requirements for disabled accessibility. The design team installed larger, bordered pathways surrounding the garage to facilitate access for the blind. The entry and exitways on the first floor are very wide and open, and most of the parking on the first level is reserved for handicapped people.

Walker Parking Consultants (San Francisco) is the prime designer and project engineer. Bull Stockwell Allen Architects (San Francisco) assisted with the design. ■

Santa Rosa Junior College, parking structure, Santa Rosa, Calif.
Photo courtesy of Rien van Rijthoven

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Indoor Air Quality

To protect the health of children, schools should have a plan to prevent and combat asthma.

When a problem affects one out of every 13 children, it clearly is an issue that schools must address.

According to the U.S. Environmental Protection Agency (EPA), that is the incident rate for asthma among the nation's children. The inflammatory disease causes a person's airways to constrict, leading to wheezing, breathlessness, chest tightness and coughing.

As part of its Indoor Air Quality "Tools for Schools" program, the EPA has put together a guide, "Managing Asthma in the School Environment," to help reduce the incidence of the disease.

"Since children spend most of their time in schools, day care facilities, or at home, it is important to reduce their exposure to environmental asthma triggers as much as possible in each of these environments," the EPA says.

The guide states that the best strategy for managing a child's asthma is to address both the medical management of the disease and avoidance of environmental triggers. Common triggers found in schools include cockroaches and other pests, mold resulting from excess moisture in a building, dander from animals, secondhand smoke and dust mites. In addition, the guide says, some health advocates believe that products used in schools—cleaning agents, perfumes and sprays, for example—can trigger asthma episodes.

The guide lists 10 ways to manage asthma in schools:

•**Use the IAQ "Tools for Schools" kit.**

•**Control animal allergens.** Remove classroom animals from the school, if possible. If not, place them away from sensitive students and ventilation systems.

•**Control cockroach allergens.** Use integrated pest-management practices to prevent cockroach and other pest problems. Store food in tightly sealed containers, and place dumpsters away from the building.

•**Clean up mold, and control moisture.** Fix moisture problems and thoroughly dry wet areas within 24 to 48 hours to prevent mold growth. Clean up hard, moldy surfaces with water and detergent, and then dry thoroughly.

•**Eliminate secondhand smoke exposure.**

•**Reduce dust mite exposure.** Make sure school facilities are dusted and vacuumed thoroughly and regularly.

•**Develop an asthma management plan for your school.** Include school policies on inhaler and other medication usage, and emergency procedures for school staff to follow when a student experiences an asthma attack.

•**Provide school-based asthma-education programs.**

•**File student asthma action cards.** Encourage students to work with their healthcare providers to identify their asthma triggers. Make sure students with asthma turn in copies of Asthma and Allergy Foundation of America action cards to their teachers and school nurses.

•**Gather additional asthma information and resources.** Establish a file on existing asthma and allergy-related information sources to use as a reference during the school year. ■

–Mike Kennedy

NOTABLE

1 of 13 The number of school-age children in the United States that have asthma.

14.7 In millions, the number of school days missed per year because of asthma.

Source: U.S. Environmental Protection Agency, "Managing Asthma in the School Environment"

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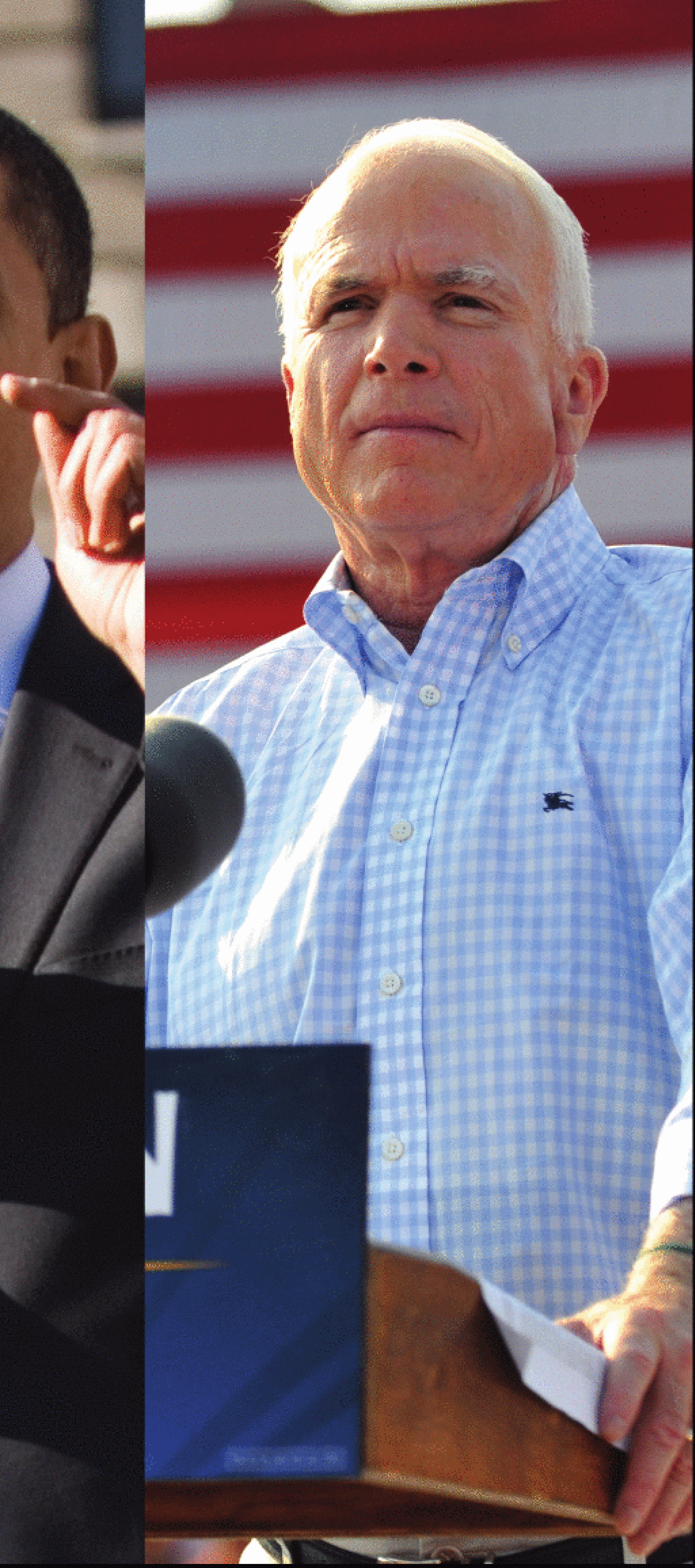
Election '08

BY MIKE KENNEDY



Candidates stake out positions on improving schools, but other issues take precedence.

Every four years, the presidential election campaign unfolds, and the position of the candidates on education is predictable: They are in favor of it.

Something else is easy to predict: In every presidential campaign, hot-button issues—some important and some infuriatingly not—suck up most of the oxygen, and the hoped-for focus on education withers and dies.

In 2008, Republican nominee John McCain and Democratic nominee Barack Obama have laid out their positions for improving America's education system; but with the nation at war, fuel prices climbing and financial institutions collapsing, subjects such as early-childhood education or charter schools don't seem as urgent.

That hasn't stopped education advocates from working to bring greater attention to what they see as the critical need to improve the U.S. education system (see sidebar, p. 20). But it's unlikely that the education platforms of either major candidate will be a deciding factor in November balloting.

Still, it's important for school and university administrators to be aware of how Obama and McCain view the education system and how they hope to improve it. Before President George W. Bush led the push for the No Child Left Behind (NCLB) Act, the generalization had been that Democrats favor more federal involvement in education and Republicans back a more hands-off approach. Now that the NCLB reform law has fallen into disfavor among many educators and politicians (see sidebar, p. 22), the proposals of this year's presidential candidates reflect the previous party orthodoxy. McCain's education platform contains few specific proposals and more statement of philosophy, specifically about giving parents more choices; Obama's campaign proposes more programs and explains them in more detail.

Choice and empowerment

McCain, in his education policy statement, asserts that his plan "removes needless bureaucracy, empowers parents, teachers and principals, and ensures that every child has the opportunity to gain from a quality education."

"John McCain believes our schools can and should compete to be the most innovative, flexible and student-centered—not safe havens for the uninspired and unaccountable," his policy statement says.

Some specifics:

•**Choice.** "Parents should be empowered with school choice to send their children to the school that can best educate them," the campaign asserts.

•**Better teachers.** "The single biggest challenge in turning around a failing school is getting quality teachers into that school," the campaign states. To attract and develop high-quality teachers, McCain would encourage alternative certification programs; provide bonuses for teachers who work in underperforming schools; and provide funding for teacher development "to perform in today's technology-driven environment."

•**Empowered principals.** McCain wants principals to be given greater control over their school budgets. "The money must be controlled by the leader we hold accountable: the school principal with a single criterion—to raise student achievement."

•**Expand the voucher program in Washington, D.C.** The

program provides funds that enable about 1,900 students in the nation's capital to attend private schools. McCain would increase the $13 million-a-year funding to $20 million, which he says would benefit about 1,000 additional students.

•**Tutors.** Students struggling to meet their state standards would be given immediate access to high-quality tutoring programs, certified either by a local district or by the federal government.

Photos courtesy of BarackObama.com

•**Online programs.** McCain wants to spend $500 million to create new virtual schools and support the development of online courses. He also would allocate $250 million for grants that states would use to create virtual math and science academies.

In higher education, McCain calls for more innovation and a removal of regulatory barriers. He says he would simplify tax benefits as well as federal financial-aid programs. "Consolidating programs will help simplify the administration of these programs and help more students have a better understanding of their eligibility for aid," the education policy statement says.

McCain also calls for making it easier for students and their families to get more information about schools and higher education. "Making this information available to families in a clear and concise manner will help more students make more informed choices about higher education," the campaign says.

In early-childhood education, McCain seeks improvements in the Head Start program. Many Head Start centers, he believes, "have fallen prey to the same institutional flaws that have undermined the larger public education system—they lack quality instructors; they lack accountability to parents; and they are focused on process, not outcomes."

The Republican wants to identify at least one successful Head Start program in every state and designate these as Centers for Excellence in Head Start. They would receive federal funding to expand their programs

In every presidential campaign, hot-button issues—some important and some infuriatingly not—suck up most of the oxygen, and the hoped-for focus on education withers and dies.

A share of the spotlight

People paying attention to the 2008 presidential campaign are more likely to be familiar with squabbles over pigs and lipstick and bridges to nowhere than they are with the candidates' positions on education.

In politics, the trivial and titillating often divert focus away from important issues. Many education advocates have been frustrated watching campaigns that show little interest in what they believe is a critical national concern: improving the U.S. education system.

Some of those education advocates, with funding from the Bill & Melinda Gates Foundation and the Eli and Edythe Broad Foundation, have created a nonpartisan organization, Strong American Schools. Its "Ed in 08" campaign seeks to make education a top priority in the 2008 presidential election.

"The world is changing, jobs are evolving, and far too many students are simply not being prepared to be successful adults," the group says.

A report the group released in September, "Diploma to Nowhere," found that as many as 1 million students enrolling in college fail placement exams. The cost for colleges to provide remediation to those students exceeds $2 billion.

"In many ways, the problem is the American high school," the report says. "It profoundly fails to prepare students for postsecondary work. A high school degree no longer demonstrates that a graduate is ready for college. Students' inadequate preparation for higher education has become a deep and widespread problem."

Ed in 08 is focused on three priorities that it believes hold great promise for improving education: agreeing on American education standards; providing effective teachers in every classroom; and giving students more time and support for learning.

The organization's website is www.edin08.com.

and disseminate their best practices to other Head Start programs.

The McCain campaign also calls for early-education programs to adhere to "meaningful, measurable standards designed to determine that students are ready for school."

Photo courtesy of John McCain 2008/JohnMcCain.com

Focusing on what works

Obama's campaign estimates that his proposals for early education and K-12 schools would cost about $18 billion, and he hopes to pay for the changes by cutting wasteful federal spending. The Democratic candidate says he wants to identify programs that work and replicate them.

"We're not going to solve our education problems just by throwing money at them," the policy states. "We have to make smart investments in innovating long-term solutions and developing a deep knowledge of what works."

Some specifics:

•**Teachers.** Obama seeks to improve schools' efforts in recruiting, preparing, retaining and rewarding teachers. The efforts would include more scholarships to help attract and train teachers; improvements in teacher education; mentoring for beginning teachers; incentives for schools that enable teachers to have shared planning time and collaborate with their colleagues; and salary incentives "for demonstrated knowledge, skill and expertise."

CONTINUED...

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•**Principals.** The Democratic candidate wants to establish state leadership academies "to enable principals to develop the sophisticated skills they need." Obama also would provide states with funds to provide principals with ongoing professional development training.

•**Math and science.** Obama would make those two subjects a national priority. His proposed teacher scholarship program would place a priority on those with degrees in math, science or technology. He also would seek to improve the assessments used to evaluate the academic performance of students in science. "Science assessments need to do more than test facts and skills," the campaign says. "They need to use a range of measures to test inquiry and higher-order thinking skills."

•**At-risk students.** Obama plans to create a $200 million grant program to support states and local districts that want to lengthen the school day or school year to provide more learning time for struggling students. He wants to provide federal support to improve education at the middle school level, including programs that identify early on who might be likely to drop out in later years. Obama also supports continuing federal efforts to help schools redesign the way they operate—initiatives such as small learning communities.

•**Research and development.** Obama would seek to boost what he describes as the inadequate amount spent on researching and developing more effective educational tools and methods. "Part of this investment will involve an R&D program for improving science education," the campaign says.

In higher education, Obama's platform focuses on making college more affordable. He wants to simplify a financial-aid application process and create an "American Opportunity Tax Credit" that will "ensure that the first $4,000 of a college education is completely free for most Americans."

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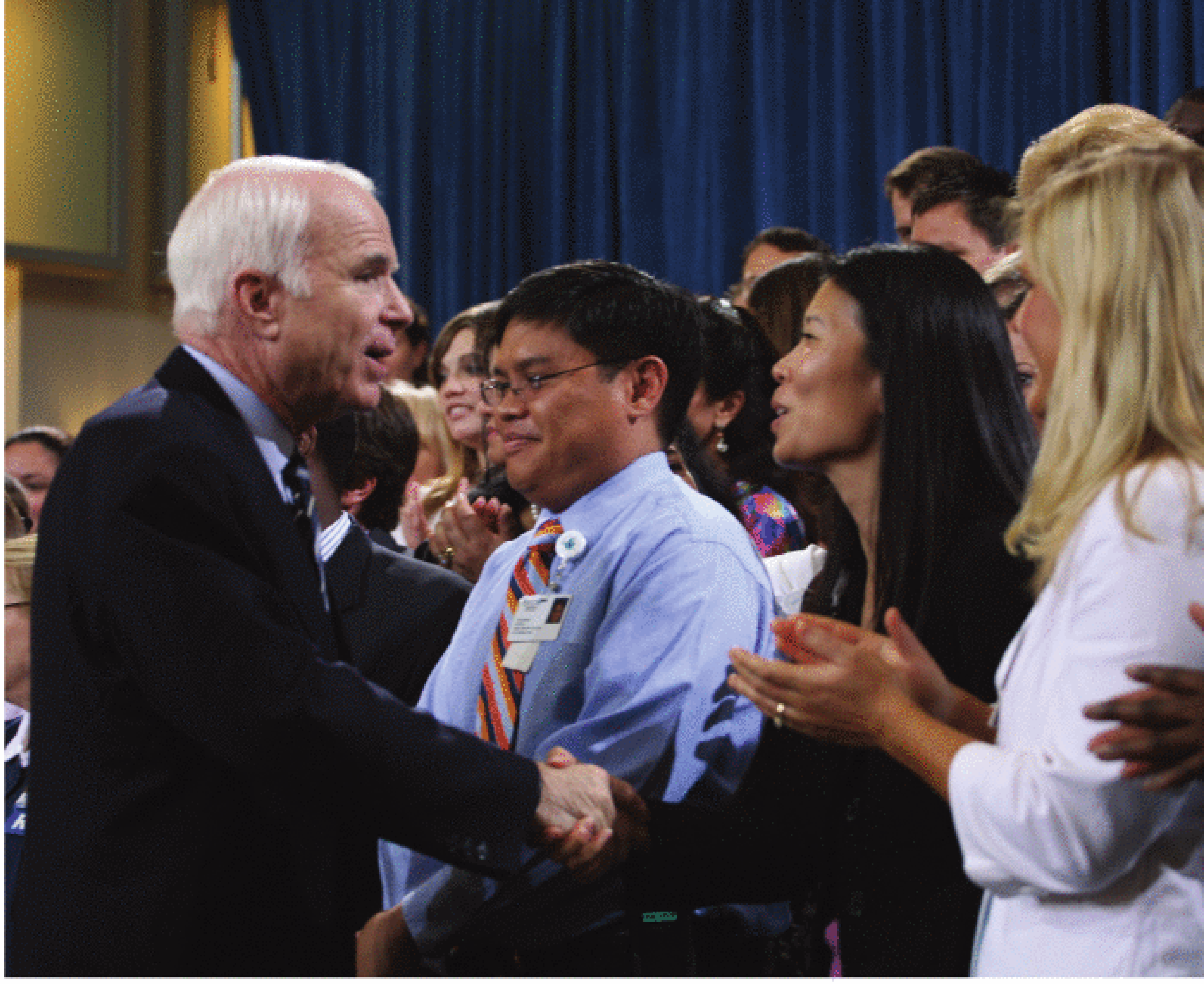

Photo courtesy of John McCain 2008/JohnMcCain.com

Legislation left behind?

The No Child Left Behind (NCLB) Act, President George W. Bush's education reform effort, was signed into law in 2002, and it expanded federal government involvement in public schools to an unprecedented level. But it's not getting much attention in the 2008 campaign; dissatisfaction with the law among state officials and educators, and the fact that it is closely identified with an unpopular president, has left the future of NCLB in doubt.

The law was due to be reauthorized in 2007, but now it appears Congress won't take up the matter until a new administration is in place in 2009.

In the waning days of the Bush administration, Education Secretary Margaret Spellings is still championing the reform effort.

"Today we know what works—effective educators, plus reliable data, plus proven strategies," Spelling told an education summit in Washington, D.C., last month. "Educators now use data to improve performance. Parents now get report cards on their schools, not just their kids. And schools now have a deadline for results: grade level or better by 2014. This is a sea change and I think we hit a nerve!"

The candidates talk of moving beyond NCLB.

Democratic nominee Barack Obama endorses the overall goal of NCLB—ensuring that all children can meet high standards—but he argues that the law has significant flaws.

"NCLB has demoralized our educators, broken its promise to our children and must be changed in a fundamental way," the campaign states.

Obama says he favors using a broader array of student assessments, not just standardized tests, and not just in the subjects of reading and math, to evaluate student performance. He also believes the accountability components of the reform law should focus on helping schools improve and not punishing those that fall short.

Republican nominee John McCain says NCLB is only the beginning of education reform. "Our goal cannot be group averages," McCain's education platform states. "Instead, our focus should be to inspire every child to strive to reach his or her potential."

McCain also says that giving parents choice in where they send their children to school is the best way for them to find a place where they can reach that potential.

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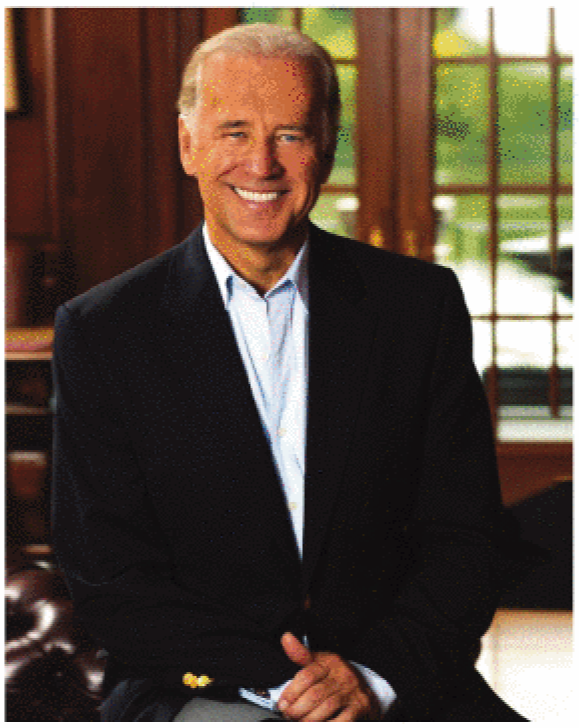

2009 vice presidential candidates, Republican Sarah Palin and Democrat Joe Biden. Palin photo courtesy of John McCain 2008/JohnMcCain.com; Biden photo courtesy of biden.senate.gov

He also wants to increase the amount that low-income students can receive in Pell Grants.

The Democratic candidate also would establish a program to help 11th-graders assess whether they are on track to be ready for college when they finish high school. Obama also seeks to boost the quality of community colleges with grants that would help institutions identify the types of skills and technical education that are in demand so they can establish new associate degree programs to address those needs.

In early-childhood education, Obama has proposed spending $10 billion on programs to educate children from age 0 to 5. He would create Early Learning Challenge Grants for states to establish programs for pregnant women and children younger than 5. He would expand the Early Head Start program, which serves children 3 years old and younger.

"The 'zero to five' plan will provide a coordinated strategy to the early education and care of children," the Obama platform says. ■

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A school administrator at Penncrest High School, Media, Pa., monitors the school's surveillance system, which has nearly 50 camera views of the school. Photo courtesy of Marc Barag

Eye on You

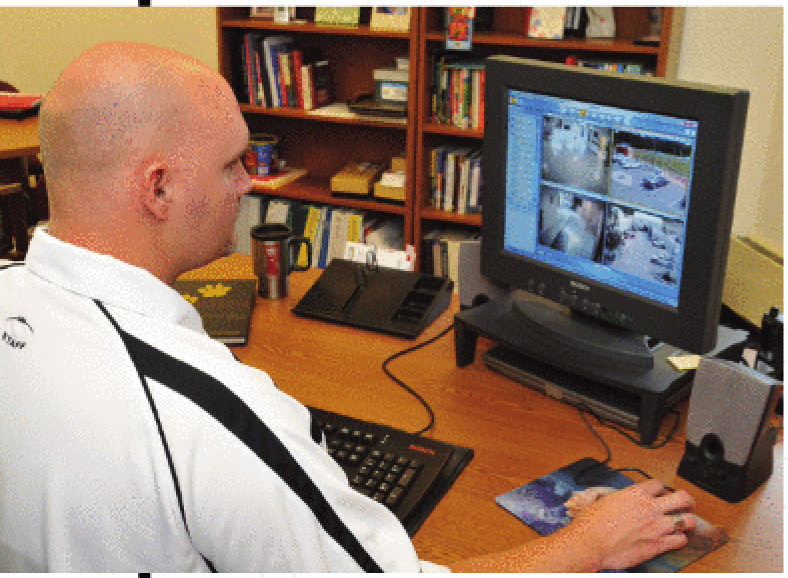
Right-sizing today's security technology to better protect the next generation.

By Paul Benne

Many of today's movies and TV crime shows exaggerate the capabilities of mainstream security equipment. The 1998 thriller "Enemy of the State" is a case in point. It presents a video recording from a two-dimensional, stationary surveillance camera, which subsequently is manipulated by a secret government agency to produce 3-D, 180-degree footage of the same scene. This might lead security system users to expect their seemingly comparable stationary camera to achieve the same performance.

However, education institutions must hold realistic expectations of their systems and equipment. Schools and universities should

A sign and camera bolster Penncrest High School's entrance security. Photo courtesy of Marc Barag



Each employee monitoring a school security system should be trained properly. Photo courtesy of Marc Barag

Where is video surveillance allowed?

In today's information era, privacy can be a rare commodity. Some educational spaces provide privacy protection, but others are legally open to surveillance. A rule of thumb: places that have no expectation of privacy, including hallways, gymnasiums, study halls, cafeterias and entrances, are fair game for surveillance. Gray areas include classrooms, areas that have a reasonable expectation of privacy, and offices. Here's how they match up:

- **Classrooms**. There generally is not a problem with placing a camera in an instructional area, but it is problematic to use the footage for evaluation purposes, as cameras have a limited scope and only tell some of the story. For example, if a camera views the teacher at her desk while students are scattered around the room working together, it may look as if the teacher is not doing her job, or what may visually look chaotic may be a perfectly executed learning exercise. Therefore, it is not an adequate tool for evaluating performance. Surveillance cameras are appropriate, however, for a classroom where evaluating an incident is crucial, as may be the case with alternative education facilities and emotional-support classrooms.
- **Areas with a reasonable expectation of privacy**. Bathrooms, locker rooms and changing areas—areas that have a reasonable expectation of privacy—typically are restricted from monitoring, but can be placed under video surveillance in special circumstances in cooperation with local authorities and with a search warrant. If a school had ongoing trouble that involved possible criminal conduct in a bathroom, it couldn't legally place cameras in the bathroom independently, but working together with local law enforcement, a school could be given authority to monitor the area.
- **Offices**. Offices can be either public or private spaces, so surveillance within one is best conducted with the occupant's consent. A well-written school policy on video surveillance will help define what is allowable under an employer's discretion. Something to keep in mind: most offices offer some expectation of solitude.

make sure that those expectations are clear before a system is installed.

Specifying the right package

The first step in building an effective security system is to establish the overall security goals of a school or university. Creating a blueprint for how the security technology will be used and defining its internal communication methods—how data will be stored, and its compatibility with future upgrades and existing equipment—is crucial.

After setting goals, the next step is to gather information. What is the intended purpose of every piece of equipment? What areas need surveillance, and what exactly is to be identified? What are the threats inside the school, and outside in the community at large? Consider any relevant past events and the type of building that needs to be outfitted. Talk to teachers, maintenance staff and administrators, and analyze ways to monitor each space properly.

Finally, address any legal considerations. From a legal standpoint, when a facility expresses a level of apparent security, it is required to perform security in a reasonable manner. Signage is the most common expressed legal consideration and can play a significant role in effective campus security. Posting signs that read, "Premises under 24-hour surveillance, all activities are recorded" or "Security cameras in use" expresses a significant sentiment to those who view them. If an incident came under litigation, and an institution wasn't living up to the expectations raised by those signs, it could be exposed to liability.

Instead, a more appropriate sign would read: "Notice: Premises under surveillance, activities may be recorded for informational purposes." This sign, unlike the others, expresses a benign indication of use and responsibility, but still may serve as a deterrent. A school would use this sign to express that it may record or use video taken for informational and not necessarily security purposes. This reaches the same objective without stating that the video is for security purposes only.

Facilities often imply some form of protective measure in normal daily

operations as well. An implied expression is one that is made indirectly. For example, when a school installs a video camera, it is implying that some form of surveillance is being conducted. Perceptions (made up of personal experiences and knowledge) drive an individual's conclusions about the implied expressions; many automatically will perceive that a camera is watching, even without actual knowledge that it is. For example, most bank patrons perceive that their financial institution records activity continuously, even if they never see a camera.

Selecting the right equipment

After defining a school's security goals, gathering information from officials, and considering the legal parameters, administrators must choose appropriate equipment.

A school should evaluate each

Equipment procurement

Once a school district or university has determined its security needs, it's time to commission the equipment vendor to make it happen. What is the best way to go about it? Three ways education institutions can procure equipment:

- **Request for proposal (RFP).** An RFP sent out to vendors informs them that your school is in the market for security equipment. Unfortunately, this general and often generic request typically is answered the way it is received—with the least amount of detail and therefore, a wide range of price tags. Vendors responding to an RFP understand that the school doesn't know the equipment, but is looking only for the lowest bid. RFPs can be a risk when the school isn't knowledgeable about what it is looking for or what it is about to receive.
- **Public bid.** A public bid differs from an RFP in that the requirements and parameters of the desired system are spelled out for the vendors; specific equipment and explicit systems tasks are already defined. The result is a more narrow scope of bidders and, therefore, a slim cost spread for the desired equipment.
- **State contract/bid combo.** Many states, including New York and Pennsylvania, have contracts with equipment suppliers that allow public institutions to purchase equipment at a reduced price without bidding. A consultant who knows how to write bid specifications using these contracts can save an education institution thousands of dollars.

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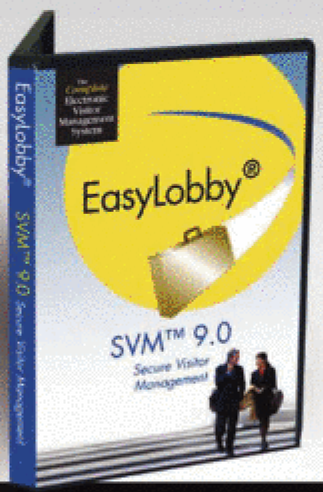

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device selected for its potential contribution toward security goals. For example, cameras are available in two basic styles: stationary and pan, tilt and zoom. Which will best meet the school's security needs? Will the cameras need to perform general or object-specific surveillance? Camera resolution and frame rate capabilities should be evaluated at this point as well.

•**Resolution** indicates the amount of lines or pixels of video information contained in each frame. This can be understood by comparing a high-definition television (HDTV) to a standard-definition television. The HDTV has more lines of resolution, thus producing a sharper, clearer image. The same applies to video-surveillance equipment; different applications call for different levels of resolution. For example, recording a high school hallway during a passing period will demand high resolution because of the elevated incident rate at that time. However, at night, the same resolution is not needed.

Most digital surveillance cameras and recording systems can be programmed to automatically lower resolution when there is little or no activity. This saves video storage space. And if a camera does detect activity during a lower-resolution period, it can be set to automatically increase its resolution as needed.

•**Frame rate** is the amount of pictures a camera takes every second. The human eye views an equivalent of 30 frames per second (fps); similarly, TV and movies (i.e. full motion, real-time video) appear in 25 to 30 fps as well. But, security equipment typically doesn't record at such a high frame rate; that consumes a tremendous amount of memory. The higher a camera's frame rate and resolution, the greater its storage capacity must be, requiring more expensive infrastructure to support the recording demands.

Camera-recorded video typically is viewed in real time (30 fps), but is actually recorded at a slower speed in order to maximize video storage. An average public venue or school cafeteria will provide adequate surveillance by recording at only 5 to 7.5 fps at standard resolution. During an alarm event, however, with the simple push of a duress button, a camera can increase its resolution and recording speed to 30 fps in order to capture the moment in real time with greater detail.

Using equipment effectively

One of the biggest school security issues is the lack of real-time information provided by surveillance equipment. Many schools install cameras and then watch an incident in hindsight.

To make schools safer, education security systems must be designed to respond to building conditions as events are actually happening. For example, video monitors should be programmed to call up and display cameras based on unusual or alarming activity. If a back door not used for building entry is opened unexpectedly, a camera should automatically position itself and display the area on a video monitor.

One way to keep track of multiple video displays is by using an audible alarm to draw attention to an activity being displayed on a particular monitor, alerting staff members to check the screen and determine if further action is needed. Also, installing duress buttons in high-incident areas allows the supervising staff to increase camera recording speed and simultaneously alert administration of a potential emergency.

In addition to obtaining and responding to real-time information, school employees must be trained to successfully navigate among cameras in different areas of the building and retrieve recorded video.

Schools should conduct systems testing monthly and maintenance quarterly, so that deficiencies can be addressed before an incident occurs. Maintenance staff can use cameras for non-security purposes, too. For example, a supervisor can log in from remote locations to view school grounds and confirm that snow has been removed properly or that maintenance work is being done.

Justifying the expense

Return on investment and total cost of ownership for school security systems can be difficult to measure, but one way to examine them is by asking: How will the system be used? A dean of students using video surveillance at one school cut a typical three-hour investigation down to just 20 minutes—all from his desk. The real return on investment, however, comes from providing a safe haven where students and staff members can work and learn comfortably. ■

NOTABLE

30 Number of frames per second viewed by the human eye.

5 to 7.5 Number of frames per second at which average public venues typically are recorded.

Benne is a senior security specialist and security discipline leader for Syska Hennessy Group's New York office. He can be reached at pbenne@syska.com.

WEB 101

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Interior spaces where students and staff will be working for extended periods of time should have view windows that provide access to exterior views.

Lighten the Load

Daylighting is a fundamental part of a sustainable design strategy for schools and universities.

By Mike Kennedy

The green movement in school design encompasses many techniques to improve the environmental friendliness and energy efficiency of a facility. Some are more complicated than others—probably not many people can explain the intricacies of a geothermal heating system, or the specifics of how solar or wind energy is harnessed. But most people can understand, on some level, the energy-saving benefits of daylighting. They've seen it in their own homes: When the bright sky floods through their windows, they can get by with less artificial lighting.

But to truly tap into all the benefits of daylighting in learning environments, including improved

academic performance from students, designers have to use approaches more sophisticated than just adding more and larger windows, and letting the sunlight stream in.

Windows renaissance

The appeal of windows in a classroom and other learning spaces began to lose out in the 1960s to other factors. More schools were being built with air conditioning, and planners concluded that having an abundance of windows would mean the air-conditioning system would run less efficiently. Administrators also were becoming more concerned about campus security, and the more windows a school had, the more opportunity vandals had to damage or break into buildings. Some educators expressed concerns that classroom windows were an invitation to students to let themselves become distracted by what was happening beyond the school walls.

By the 1990s, more school facilities were being constructed, and builders could choose more energy-efficient windows that did not compromise a building's climate-control system. Among designers, a consensus began to grow that daylight once again was considered desirable and beneficial for education spaces.

The study most often cited for jump-starting the embrace of daylighting in school design, a 1999 report from the Heschong Mahone Group, "found a uniformly positive and highly significant correlation between the presence of daylighting and student performance."

Be aware of glare

But the details of the study made it clear that not any kind of daylight would bring about such positive results. Windows and skylights that created glare on walls or desks affected performance negatively.

Regarding classroom skylights, the systems that performed well provided diffuse distribution of daylight by using diffusing lenses or diffusing louvers and wells; prevented direct penetration of sunlight into classrooms; and enabled teachers to directly control the amount of daylight by using louvers or blinds. The systems that did not perform well or had negative effects allowed direct partially diffuse sunlight into classrooms; relied on automatic controls, which were not performing as originally intended; and created small areas of very high daylight illumination.

"It was clear that successful daylighting from windows prevented the penetration of direct sunlight into classrooms," the report says.

The report concluded that designs should incorporate strategies such as light shelves, roof monitors, baffles, louvers and reflective surfaces to spread light throughout a learning space.

"It is critical that in all classrooms, gymnasiums, media centers and administrative spaces, sunlight is either bounced, redirected or filtered so that direct radiation does not enter a part of the room where this could be problematic," says "The Design Guide for Daylighting Schools," created by the architectural firm Innovative Design.

Daylight emerges

This decade, the twin benefits of greater energy efficiency and higher academic scores have made daylighting strategies an almost obligatory part of modern school construction.

"Rather than selecting fenestration simply for view or aesthetics, architects must now carefully consider the amount and distribution of daylight," says the Collaborative for High Performance Schools (CHPS) *Best Practices Manual*.

The CHPS guidelines state that all interior spaces where students or staff will be working for extended periods of time should have view windows that provide access to exterior views. "A view window should be optimized for the visual comfort of the occupants, rather than for provision of daylight," the manual says.

High clerestories are used in perimeter walls to admit daylight deep into a space. Using light shelves or louvers with clerestories can improve daylight distribution. Toplighting from skylights or roof monitors also helps distribute daylight evenly throughout a room.

The manual lays out six principles to guide designers incorporating daylighting into an education facility:

•Prevent direct sunlight penetration into the space. "It is essential that designers understand the basic principles of solar orientation, climate conditions and shading systems," the manual says. "… The first step in good daylighting design is the thoughtful orientation of the buildings on the site, and orientation and size of the fenestration openings."

•Provide gentle, uniform light

Bouncing the light

Daylighting is a key component in the design of Reedy Fork Elementary School, a 725-student facility that opened last year in Greensboro, N.C.

Innovative Design, architect for the project, says the school has curved, translucent light shelves and reflective ceiling tiles inside classrooms to provide uniform levels of light while using 40 percent less glass than what is normally used in daylighting applications.

"Because of the translucent nature of the light shelf and the design of the aperture, glare is minimized," the firm says.

The facility also has south-facing roof monitors with translucent fabric baffles in the light wells that distribute natural light throughout the interior.

"Clear double glazing is used to maximize visible light transmittance and minimize glass-to-floor ratio," the firm says. "Adequate overhangs over the monitor windows protect the spaces from direct light during peak periods."

throughout the space. "Evenly diffused daylight will provide the most energy savings and the best visual quality," CHPS asserts. "… It is easiest to achieve uniform daylight illumination through toplighting strategies."

•Avoid creating sources of glare. "Eliminate glare by obscuring the view of bright sources and surfaces with blinds, louvers, overhangs, reflectors, and similar automatic or manually operated devices," the manual says.

•Allow occupants to control the daylight with operable louvers or blinds. "Exterior shading is the most energy-efficient, since it intercepts the solar gain before it enters the building," the CHPS states.

•Design the electrical lighting system to complement the daylighting design. "The electric lighting should be circuited and controlled to coincide with the patterns of daylight in the space," the CHPS says. "… Manual controls are substantially less expensive, but they need to be convenient and well labeled to ensure their use. Automatic controls assure savings, but they are more expensive and must have overrides so the occupants can darken the room for audio-visual use or when they just don't want the lights on."

•Lay out interior spaces to take advantage of daylight conditions. "It is important to locate work areas where appropriate daylighting exists," the manual says. "… In general, work areas should be oriented so that daylighting is available from the side or from above. Facing a window may introduce direct glare into the visual field, while facing away from a window may produce shadows or reflected glare."

To help planners visualize how and to what extent daylight will enter a building, computer programs are available that simulate how daylight and electric light illuminate a space. "These tools are effective in integrating the contributions from windows and skylights, as well as electric lighting systems," the CHPS manual states. ■

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NOTABLE

25 to 40 The percentage share of a typical school's energy costs attributed to lighting.

Source: U.S. Department of Energy

30 to 40 The percentage recommended window-to-wall ratio for effective daylighting.

Source: Lawrence Berkeley National Laboratory, "Tips for Daylighting with Windows."

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Birds and bats can carry more than 60 different diseases that are transmittable to humans.

The Birds and the Bees

Prevention and staying on top of infestation are key to avoiding pest problems in education settings.

By Kelly Crost

When choosing a school or university, most students or parents do a little research on specific programs: the location, the academic curriculum or the school's extracurricular activities. What they probably don't think about are pests on campus. Repeated infestations of birds and other pests give potential students two other areas to think about: their health and how safe they are in these academic and living environments.

Useful questions

With pests swarming among students, education institutions have to find ways to keep school health-code

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inspectors at bay. Some questions to ask:

•**Are schools at risk?** Birds and bats can carry more than 60 different diseases that are transmittable to humans. Histoplasmosis, for example, is a respiratory disease that can be fatal and comes from a fungus that grows in dried bird droppings and bat guano. If people don't take care in removing bird and bat excrement, they can open themselves up to harm from microscopic invaders. Rats, on the other hand, can carry hundreds more lethal diseases, including smallpox, Ebola, hantavirus and rat-bite fever, which can be acquired through the bite or scratch of a rodent, or the ingestion of food or water contaminated with rat feces.

Many products target animal senses, including taste, sound and sight.

•**Can pests cause property damage?** The biggest concern for parents and school officials is the health of children in learning institutions. But many don't pay enough attention to the potential physical damage associated with lingering pests and their fecal matter. Bird droppings and bat guano have acidic elements that can erode wood, metal and steel. The droppings don't cause immediate damage, but bird droppings left to linger can lead to deteriorating school facilities. Birds will nest just about anywhere that can provide shelter, including roofs, ceiling vents, wall vents, chimneys and soffits. This nesting can cause stains and structural damage. Bird guano corrodes not only metal, but also a number of building materials, including concrete, stone, tar shingles and brick. Although it is not as life-threatening, it definitely can burn a hole in any school's budget.

•**Are schools at risk for lawsuits?** Bird droppings can be slick, which can cause students to slip and fall, resulting in injury. Diseases from infestations that are transmitted at school, whether on a soccer field, in the school cafeteria, or even breathing in toxic air, can make a school liable.

•**How can education institutions solve the problem of bird, bat and rodent infestation?** Guns, dogs and plastic owls have been the solutions of choice, but pest-control companies have discovered that although these "solutions" may have worked, they work for only a little while. More humane, eco-friendly ways exist that can permanently rid school facilities of troublesome birds, bats and rodents. Non-toxic, non-lethal and non-harmful is the new motto. Schools have been introduced to many different environmentally friendly solutions. Many products target animal senses, including taste, sound and sight. Each product's goal is to deter and repel pests while respecting their existence.

•**What's the difference between toxic and non-toxic?** Be careful when deciding on a taste-aversion solution. Some products contain chemicals that can cause severe illness or death to the pests and even humans who come in contact with them. Non-toxic taste aversions, which are applied to areas where birds like to feed, are a popular tactic. The solution, which is not harmful to humans but is repulsive to the palate of birds, is mixed with water and is applied to grass, trees, crops and vegetation. Therefore, the bird and or pest is not harmed, but its taste buds are. Basically, when the food source goes, so will the pests.

•**Are there products on the market that can cover a large area such as an education institution?** An ultrasonic device uses sound waves that irritate birds, yet are silent to humans. They work well in semi-closed locations, such as under a bridge, where the structure can reverberate and amplify the sound. Sonic devices use real alarm sounds made by pest birds and predator sounds of their natural enemies that scare the pests away. These devices work for larger areas and can cover up to six acres. Multiple sounds and programmable settings allow a user to vary the bird-scaring soundtrack for optimum effect.

NOTABLE

60 Number of different diseases carried by birds and bats that are transmittable to humans.

Proactive measures

Keeping education institutions sanitary takes more than a mop and broom. Many schools still are not aware of the health risks, lawsuits, code violations and damage that pests can cause. Without a permanent solution, there could be a hefty price to pay. Pests cannot be avoided; the best solutions use humane deterrents and repellers to create situations that are unsavory to them. Prevention and staying on top of the infestation are key to avoiding these pest problems altogether. Education institutions that embrace such measures can help save their money, health and reputation. ■

Crost is a former media correspondent with Bird-X, Inc., Chicago, a manufacturer of green and humane bird deterrents and repellers. For more information, call (800)662-5021, or visit bird-x.com.

It Pays to Update

Keeping HVAC systems up and running.

From the 1960s to the 1990s, HVAC systems in schools grew more sophisticated. Education institutions sought systems that conserved energy and helped improve indoor air quality.

When a building opens, systems usually operate as designed. As time goes by, they function less effectively. During the design of Red Wing High School, Red Wing, Minn., in the 1990s, life-cycle costing, value engineering and energy-conservation studies resulted in considerable cost savings:

•Rebates of $203,000 from the local utility company.

•Annual energy savings of $120,000.

•Preconditioning outside air during the heating season reduced the original boiler capacity requirements by 400 boiler horsepower and produced a first-cost savings of more than $500,000.

•Eliminating the need to install heating coils in the air-handling units resulted in an additional first-cost avoidance of $100,000.

•Reducing the size of chilled- and hot-water piping created more first-cost savings.

Mechanical equipment was situated close to acoustically critical spaces, such as the media center, classrooms, band, choir, orchestra hall and auditorium. Engineers worked with manufacturers and acoustical consultants to achieve the desired noise criterion (NC) levels. The HVAC system uses a mixed-flow-type fan design, which reduces airside noise by 20 decibels in the first two octave bands compared with conventional centrifugal fans. The system's round ductwork provides a 25-decibel reduction in duct breakout noise in the lower octave bands compared with regular ductwork. Integrating double-walled discharge plenums, the mixed-flow-type fans and the round ductwork allowed the school to eliminate almost all attenuators and achieve desired acoustic goals.

After several years of operation, the school adopted a new IAQ management plan to create a healthful environment. System maintenance became much more aggressive and frequent. All air filters in the district were changed from low- to medium-efficiency, or to high-efficiency HEPA filters (none of which use fiberglass). Pre-filters are used to extend the life of the HEPA filters.

As institutions upgrade HVAC systems with sophisticated equipment, the staff needs to be trained on proper operations and maintenance. Even after initial training, some staff members ignore proper procedures, which can lead to equipment problems. Training should include basic equipment operation, air-handling systems, energy recovery, heating systems, cooling systems, identifying problems, and operating computers for energy-management systems.

Building commissioning also can be an important step after a new facility is built. It ensures that building systems are designed, installed and tested to perform according to the design and a school's operational needs. A five-year cycle should be created for re-commissioning to make sure the systems still are operating correctly and providing energy savings as designed. ■

JAMES E. RYDEEN

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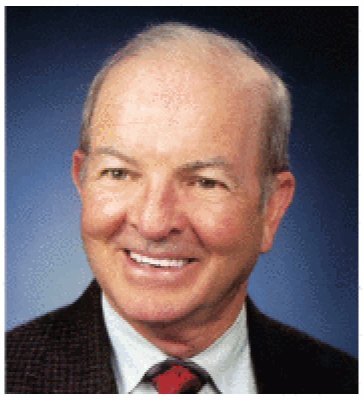
Get Real

Establishing a realistic estimate for education technology.

C. WILLIAM DAY



Day is senior analyst at KBD Planning Group, Young Harris, Ga., a firm specialized in education facilities and technology planning. He can be reached at bday@kbdplanning.com. www.kbdplanning.com

When establishing a budget for school building projects, administrators often give short shrift to education technology. Many continue to be baffled by how to establish realistic costs for these infrastructure needs—even though the past 20 years have proven that technology no longer is an optional add-on.

In a recent renovation and addition project at a 60,000-square-foot elementary school, the budget included $360,000 for education technology. This line item was placed in the bond referendum passed by the voters. Only after the bond referendum passed was there any talk about the specific scope of technology that the school needed. Where did the $360,000 figure come from? An initial estimate of $20,000 per classroom ($720,000 for 36 classrooms) was cut in half arbitrarily because of fears that voters would think the figure was too high.

After planners determined the school's actual needs, the low bid came in at $899,992; that's a shortfall of about $540,000. The response from the construction manager was: "Do the bricks and mortar now; you can always add the technology later."

All too often, this story gets repeated in education institutions. The information is available to provide schools and universities with realistic cost estimates for technology systems. So, professionals owe it to their school clients to use solid data on cost projections for technology, just as they do for other building systems.

How much does technology cost for a school building? The technology systems for a school building include wiring infrastructure; data networking hardware, including network servers; an IP telephony system; a classroom presentation system, including a streaming video system; a paging/intercom system; an IP security camera and intrusion alarm system; and a wireless networking system. Establishing the cost estimate and then dividing it by the total square footage of the building provides a cost-per-square-foot cost. Based upon projects totaling about $25 million, technology systems for elementary schools cost about $11.90 per square foot, and for secondary schools cost about $14.75 per square foot.

How do these square-foot dollars (as a percentage of the total cost) break down?

- Wiring infrastructure: 18.
- Data networking: 18.
- Voice communications: 8.5.
- Streaming video: 36.
- Security systems: 9.
- Paging, intercom and clocks: 8.5.
- Wireless network: 2.

These numbers will vary depending on the geographical area, and the quantity and quality of equipment selection. Still, having a benchmark for schoolwide technology systems helps establish a realistic technology budget. ■

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Continual Improvement

Conducting a cleaning audit: Part 2

STEPHEN ASHKIN

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Last month's column was the first of two designed to help schools and universities identify opportunities in a green cleaning program. That column covered what to look for when auditing supplies and equipment. This column will identify opportunities relating to the overall quality of the cleaning itself, as well as issues associated with training, procedures and other components:

•**General cleaning assessment.** A simple walkthrough of the building can assess the state of cleanliness and orderliness. Evaluate entryways, restrooms, offices, classrooms, cafeterias and food-preparation areas, laboratories, conference rooms, media centers, athletic facilities and health facilities. Note conditions and areas for improvement. Some "red flags" to note:

-Visible soil, mold and dust. Pay attention to odors.

-Insects and rodent droppings.

-General disarray. Note offices, classrooms and work spaces where desks, credenzas, cabinets and floors are so cluttered that dusting and floor care cannot be conducted.

-Note mismanagement of recycling and trash, such as wet trash in recycling bins or office paper in wet trash bins.

-Dirty and smelly restrooms.

-Look beyond "typical" cleaning issues. For example, note cardboard taped to diffusers, personal air filters or space heaters, collections of cleaning products brought from home, etc.

•**Cleaning procedures.** Observe how cleaning crews clean. How efficiently and effectively are they cleaning? Do they need training on the appropriate use of equipment? Are they emptying filter bags and capture tanks at the appropriate intervals? Are they mixing and using chemicals correctly? Are they disposing of waste products correctly? Are they using hot water when cold water would work? Are they protecting themselves from back and other injuries? Are they handling recyclables and waste appropriately? Some "red flags:"

-The lack of written plans and written standard operating procedures.

-The lack of specific daily job cards and work assignments.

•**Assessment of storage areas.** A simple assessment can identify immediate storage problems, such as incompatible chemicals, electrical or other issues. Also note how the area itself is organized. Often, simply organizing a storage area can help manage inventories, reduce waste and reduce the time getting employees started. Some "red flags:"

-Incompatible products, such as bleach and ammonia being stored together.

-Leaking or damaged products.

-Flammable products.

-General disarray and clutter.

Numerous opportunities will arise from the audits. Highlight key opportunities, and once the green cleaning project begins, improvements can be made through the process of continual improvement. ■

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strategies to create sustainable, high-performance facilities

INSIDE THIS SPECIAL SECTION:

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Staley High School, Kansas City, Mo., a 305,000-square-foot high school completed in June 2008 and certified LEED silver

Architect: Hollis + Miller Architects
Photographer: Alistair Tutton Photography

A Green Role Model

Ten techniques for a greener campus: sustainable steps to enhance existing schools.

By Paul J. Hoffman

Daylighting is abundant in the commons area at Northland Pines High School, Eagle River, Wis.
Photo ©Image Studios

Building a new green campus and adopting a philosophy of sustainability is exciting, but if not done properly, it is not always the wisest decision. As you consider the education, health and safety of a campus community, along with its business objectives, you may discover that there are numerous ways to make the campus more sustainable without razing a building or erecting a new facility. Sustainability should be about the business solution, as well as the environmental solution. It also must be endorsed, encouraged and embraced by the highest level of authority in the district or college administration.

When you begin thinking about new construction, remodeling or campus updates, consider using a planning approach model that analyzes the concepts in a Venn diagram of four concentric circles: budget-driven costs; value-added life-cycle cost savings; more healthful buildings for people; and environ-

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When planning a construction or renovation project, consider the Venn diagram of four concentric circles.

mentally responsible materials, methods and systems (see diagram above).

Pick and choose

Whether remodeling a facility or just making a few adjustments and replacements, here are 10 ways to make your campus greener—first with the people, then with the products and building systems:

1. Equip teachers and students. Many misconceptions exist about what it means to be green and the benefits it provides in terms of indoor air quality, visual appeal, daylighting, and environmentally friendly products and systems. Make facility users part of the solution, and get them engaged in the process. Consider how you can communicate effectively with teachers and students. Get them involved with experts such as planners, architects and construction managers, and provide a holistic knowledge of sustainability via assemblies, class projects, contests and inner-campus television programming.

2. Develop buy-in with parents. Help parents understand the enhanced value and health benefits that can occur through integrated, responsible, sustainable solutions. Educate them through PTA meetings, handouts, new-student orientations and Web updates. Parents need to see how environmental solutions affect their children's education in school and at home.

3. Use new furnishings and building finishes that have low or no VOCs (volatile organic compounds). It is becoming common to consider the amounts of VOC in paint, flooring, carpeting, adhesives and sealants, but you also should consider the VOC levels in furniture, fixtures and equipment. A wide array of no- or low-VOC products—including desks and chairs—increasingly are available at competitive prices. Many also incorporate recycled content and are made with future recyclability in mind.

4. Electric audits of lighting, IT and other systems. Some energy providers offer an electric lighting audit as part of an energy-reduction strategy. Some even provide financial incentives for converting existing lighting to energy-efficient lighting. A lighting survey of lighting levels, fixtures and lamps supported by economic analysis will provide the basis for energy-saving changes and lighting improvements that can improve the bottom line while reducing a building's carbon footprint.

Dining facilities often have the highest potential for increased savings. Assessment of lighting levels and light quality relative to the visual task being performed is important. Overlighted areas waste energy, and inadequate or poor-quality light may reduce employee and student productivity. Time clocks, and occupancy and photosensors can reduce unneeded lighting in unoccupied or daylighted spaces.

5. Consider glare and thermal performance in window selection. In recent years, technological advances have enhanced the thermal and daylighting performance of windows. These technologies include better edge-sealing techniques, improved framing materials, low-emissivity, tinting, and solar-control coatings, low-conductance gas fills and edge spacers. These advances should be used to provide views and optimize building performance. Window films can improve the performance of existing windows.

6. Reduce water use. Annual water consumption can be reduced by up to 50 percent by using low-flow toilets, urinals, sinks and showers, and tankless water-heating systems. But don't stop inside the building; consider what you can do throughout the grounds. Consider adding retention

From the inside

Key questions to ask if conducting a lighting audit:

- Has the function of the building remained the same since its construction? Is there a lighting schedule for indoor and outdoor lighting?
- Have you converted from incandescent lighting to fluorescent?
- Can the lighting controls be upgraded to provide greater flexibility and energy savings?
- Are you still using standard magnetic or electronic ballasts instead of energy-efficient electronic ballasts?
- Have you converted from standard fluorescent to reduced-wattage, high-efficiency fluorescent lamps?
- Have employees been canvassed regarding inadequate or excessive lighting?

Pecatonica High School library, Pecatonica, Ill.
Photo ©Weston Imaging Group

An exterior courtyard provides natural daylight to the commons area at Pecatonica High School.
Photo ©Weston Imaging Group

basins to retain stormwater and replenish groundwater, and remember to use native plant species that do not need irrigation.

7. Evaluate heating, ventilating and air-conditioning (HVAC) systems. HVAC system operation or upgrades play a critical role in reducing energy consumption and costs over the life of facilities. It's important to monitor and evaluate your system's performance to be certain it runs at its optimal level. Also, monitor the CO_2 levels to be certain that air quality is at a level that is healthful for students and staff. Once a system is installed, preventive maintenance likely is the most important consideration. Simple behaviors like changing filters regularly can translate to significant energy savings. Continuing HVAC education for maintenance personnel is a wise investment to lower the need for expensive outside technicians and to keep systems fine-tuned and running at optimal levels.

8. Establish critical baselines and measure performance. Establish a baseline for existing energy and water use, and then set targets for improvement. Over time, measure performance and savings against these targets. Assign one person to collect and monitor data to evaluate facility performance. If system inefficiencies are discovered, make adjustments. Evaluating the updated facility before and after can ensure you are receiving the anticipated economic benefits.

9. Let your neighbors serve you. When schools buy products and services from local businesses, they have a positive effect on the environment. This reduces the energy needed for transportation, keeps dollars within the local economy, and develops stronger relationships within the community.

On one recent project near St. Paul, Minn., a school district specified a local wood window manufacturer that developed a new glass and used FSC (Forest Stewardship Council) wood for its commercial window product lines. The district's choice was a boon to the local economy and helped a business achieve a new product offering, which ranks among the most sustainable wood windows on the market.

10. Be clean and green. Educate facilities staff on how cleaning products can affect the health and welfare of facility users. New York state school districts now are required to reduce the exposure of children and school personnel to harmful cleaning substances. As a result, every public school in the state is cleaned with environmentally preferable products. Establishing a program like this could build community respect and appreciation as you care for the needs of students and staff. ■

Hoffman is president of Hoffman LLC, a Wisconsin-based architectural and construction-management firm. He can be reached at phoffman@hoffman.net.

Community Commitment

How education institutions can best use green strategies in their construction projects.

By Paul W. Erickson

Daylighting is provided throughout Sunrise River Elementary School, North Branch, Minn., through properly oriented windows, skylights and clerestories. Photo courtesy of Rick Peters

Education institutions that embrace green concepts in their construction projects are able to provide safe and healthful learning environments that are responsive to the community. Carrying out these strategies can enhance student learning, reduce health and operations costs, and enhance the quality of a school. Moreover, these high-performing schools become visible statements of a community's commitment to future generations of learners.

Doing your research

Research shows that green, high-performing schools provide the following benefits:

•Improved student performance.

•Reduced absenteeism.

•Increased comfort for teachers and students.

•Reduced liability exposure.

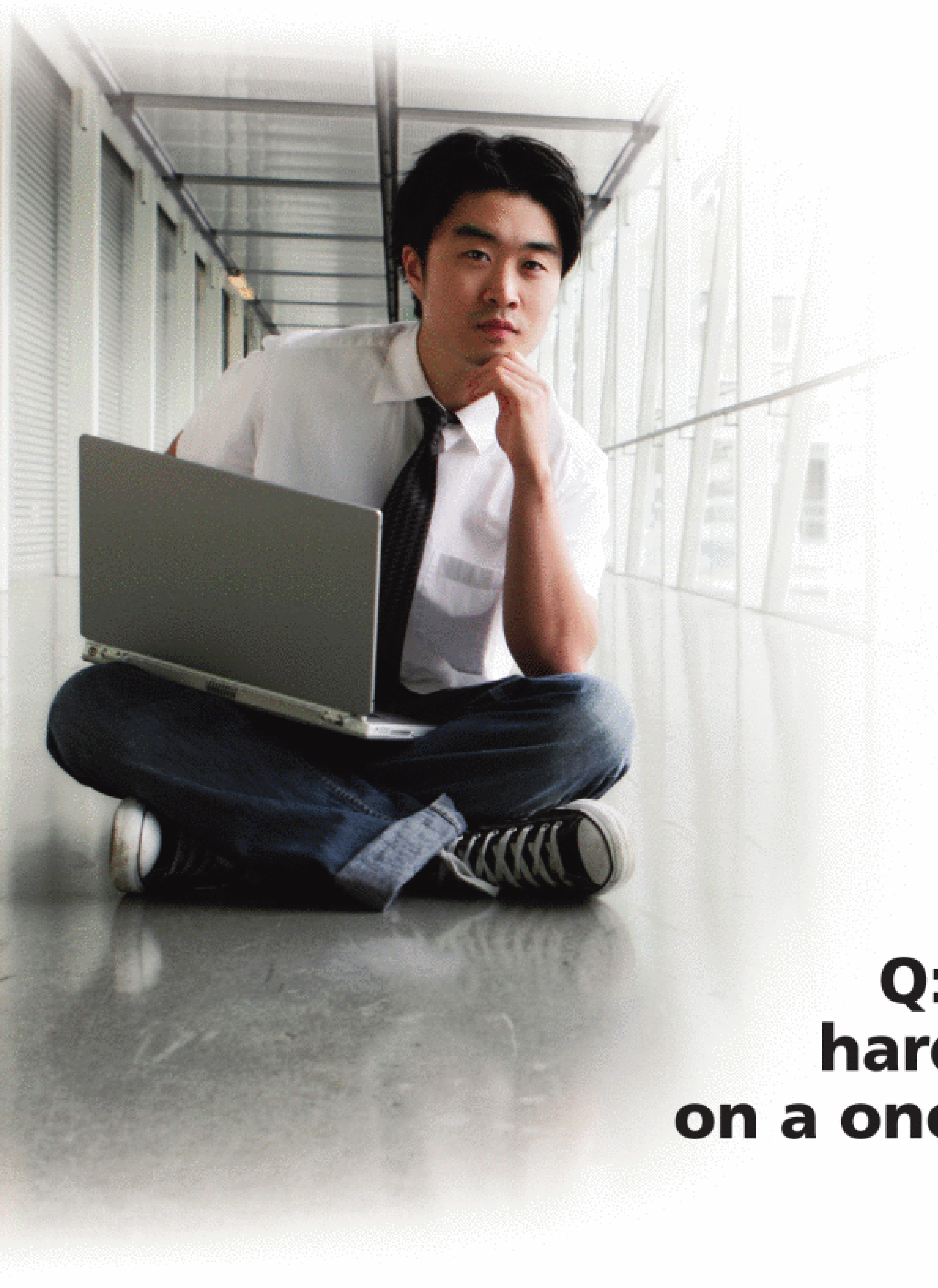
•Reduced operations and maintenance costs.

•Reduced reliance on fossil fuels.

•Reduced environmental impact.

•Better educational examples for students and the community.

One method for evaluating a green school design is the U.S. Green Building Council's (USGBC) Leadership in Energy and Envi-



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A north-south building orientation at Andover High School, Andover, Minn., captures daylighting for all instructional spaces, thereby reducing overall energy operating costs. Photo courtesy of Ralph Berlovitz

> Many of the best examples of green concepts in construction projects are common-sense strategies that result in quick cost payback, low energy consumption and enhanced learning environments.

ronmental Design (LEED) rating system. LEED for Schools, an application of LEED that recognizes the unique aspects of design and construction of K-12 schools, addresses issues such as master planning, classroom acoustics, mold prevention, indoor air quality and joint use of facilities.

During the planning and design phase of a project, a LEED-accredited architect can guide the education institution with green design strategies.

Best practices

Many of the best examples of green concepts in construction projects are common-sense strategies that result in quick payback, low energy consumption and enhanced learning environments. During the design and construction of a project, education institutions can focus on sustainable sites, water efficiency, energy and atmosphere, materials and resources, environmental quality, and innovation and design to incorporate cost-effective concepts as follows:

•**Sustainable Site:**

-Design a compact two-story building to reduce the footprint and site impact.

-Use native trees or shrubs to reduce watering and maintenance.

-Shield lighting to avoid light pollution to neighbors.

-Plant trees and grass islands to reduce parking lot heat buildup.

-Provide priority parking for hybrid vehicles and carpools.

-Design bio-swales to clean and cool water runoff.

-Retain stormwater on site to control water quality and quantity.

-Provide bike racks and walking paths to encourage alternative transportation.

-Protect open space and wildlife habitats for environmental learning.

-Reuse on-site soil material during construction to eliminate off-site trucking disposal.

•**Water Efficiency:**

-Use a stormwater-retention pond for irrigation, which reduces potable water usage.

-Provide water-reducing fixtures with sensors on urinals, lavatories and water closets.

-Install waterless urinals and dual-flush water closets.

•**Energy and Atmosphere:**

-Orient classrooms in the north-south direction for optimal daylighting.

-Provide occupancy sensors for lighting and ventilation.

-Design energy recovery and thermal energy storage in mechanical systems.

-Incorporate ice storage for mechanical cooling systems.

-Provide variable-frequency drives in HVAC design.

-Conduct energy monitoring and trend logging of energy usage.

-Use renewable energy sources.

-Consider geothermal mechanical systems.

-Design a well-insulated building for energy savings.

-Integrate commissioning of HVAC systems into the project.

-Use refrigerants with low ozone depletion.

-Use appropriately sized high-efficiency chillers, boilers, motors and filters.

•**Materials and Resources:**

-Specify regional materials to reduce transportation costs.

-Specify products with recycled content and low- or no-VOC (volatile organic compounds) emissions for indoor air quality.

-Provide durable, long-lasting, easily cleaned materials.

-Consider using recycled glass-chip terrazzo, low-maintenance glazed or burnished-block walls,

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Green concepts in the design of Bay Harbor Elementary School, Suamico, Wis., include mechanical systems with heat recovery, variable-frequency drives, occupancy sensors and low-intensity lighting with integrated daylighting. Photo courtesy of Bob Freund Photography

ground-concrete floors, linoleum flooring, bio-based floor tile, low-VOC water-based paints and sealers, wood from certified forests (floors, doors, etc.), energy-efficient glazing, carpet tiles with recycled materials, steel with recycled content, and furniture with formaldehyde-free core materials.

-Use reflective roofs or green planting roofs, which reduce temperature as light and heat is reflected back into space rather than absorbed and radiated locally.

-Specify low-dust, high-impact, recycled-content acoustical ceilings.

-Incorporate waste management during construction.

-Design space for recycling into the building project.

-Specify recycling processes during construction.

•**Indoor Environmental Quality:**

-Incorporate daylighting throughout the building with outdoor views.

-Include detecting devices for air quality and flow assessment.

-Design luminance levels to reduce glare.

-Situate mechanical equipment and VAV (variable-air-volume) boxes for acoustical control.

-Provide acoustical treatment in corridors, classrooms and large-group spaces.

-Provide voice-enhancement technology in classrooms.

-Incorporate 100 percent fresh air via mechanical systems with a natural ventilation option.

-Specify high-performance energy-management controls.

-Consider displacement ventilation to minimize air particulates.

-Isolate exhaust systems to reduce contaminants.

-Situate controls for individual space thermal comfort and moisture control.

•**Innovation and Design:**

-Design multiuse spaces resulting in less square footage.

-Use the school building as a teaching tool.

-Design secure zones for gyms, cafeterias, auditoriums and libraries for community use.

-Emphasize community and school shared use of building and play fields.

-Specify water- and energy-efficient food-service design.

-Engage utility companies for energy rebates.

-Prevent air and moisture contamination of absorptive materials during construction.

-Specify a tobacco-free construction site.

-Select materials and systems based on life-cycle cost analysis.

-Use negative-air machines and high-efficiency particulate air vacuums for dust control during construction.

Setting an example

Research has found that asthma, flu, sick-building syndrome and respiratory problems result from unhealthful schools. Green design can alleviate those problems. Temperature comfort and control affect teaching quality and student achievement. Effective daylighting strategies can reduce student absenteeism and encourage greater student performance. Healthful schools with daylighting, improved ventilation and acoustics, non-toxic materials, and improved air and light quality provide for a more productive learning environment.

High-performance schools can become teaching tools that help students and community members learn about resource management and conservation. The building becomes a model to teach about responsible fossil-fuel usage, reduced water usage, energy efficiency, recycling, selection of materials and thorough planning. ■

Erickson is president of ATS&R Planners/Architects/Engineers, Minneapolis, which specializes in pre-K to 12 school planning and design. He can be reached at perickson@atsr.com.

WEB 101

For more articles on how to go green at your school or university, sustainable design practices and planning for energy-efficiency, visit www.ASUmag.com/green.

Green goals

Solar electric system contributes to university's sustainable energy program

University of California, San Diego.
Photo courtesy of UC San Diego

Borrego Solar Systems, Inc. The University of California, San Diego, recently unveiled a comprehensive, campuswide sustainable energy program designed to produce 29 million kilowatt hours of green energy annually. Part of the university's robust plan called for a large solar electric system to be installed on several buildings.

The university chose to work with Borrego Solar Systems, Inc. to install the photovoltaic array. The 1.2-megawatt system consists of 5,790 Kyocera KD205 solar modules mounted on the Price Center, the Gilman parking structure and other buildings across the 1,200-acre campus. It will produce about 1.5 million kilowatt hours of green energy per year, contributing to the university's overall sustainable energy goals.

To finance the $9 million cost of the solar system, the university worked with Solar Power Partners to develop a customized power purchase agreement that would meet its long-term budgetary requirements. As the owner of the system, Solar Power Partners will sell all of the electricity produced by the system to the university. This arrangement enables the university to access solar-generated electricity without incurring the capital or long-term operational costs to procure and run the system.

When complete, UC San Diego's green energy program, which also includes biogas fuel cells and wind energy, will produce enough electricity to power more than 4,500 homes. Its program will offset about 10,500 tons of carbon emissions, which is the equivalent of removing 1,500 cars from the road every year.

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Mobile cleaning unit

Hydro Systems. The ICS 8900 mobile integrated cleaning system provides several green benefits. The rechargeable, battery-powered system is an affordable, self-contained, portable cleaning system that uses correctly dosed cleaning chemicals that are applied by spray nozzle using low-flow/low-pressure technology. Its unique flow design uses only one-half gallon of cleaning solution per minute, eliminating the need for wet/dry-vac recovery and the handling of contaminated water, while reducing the slip-and-fall risk at the same time. ■

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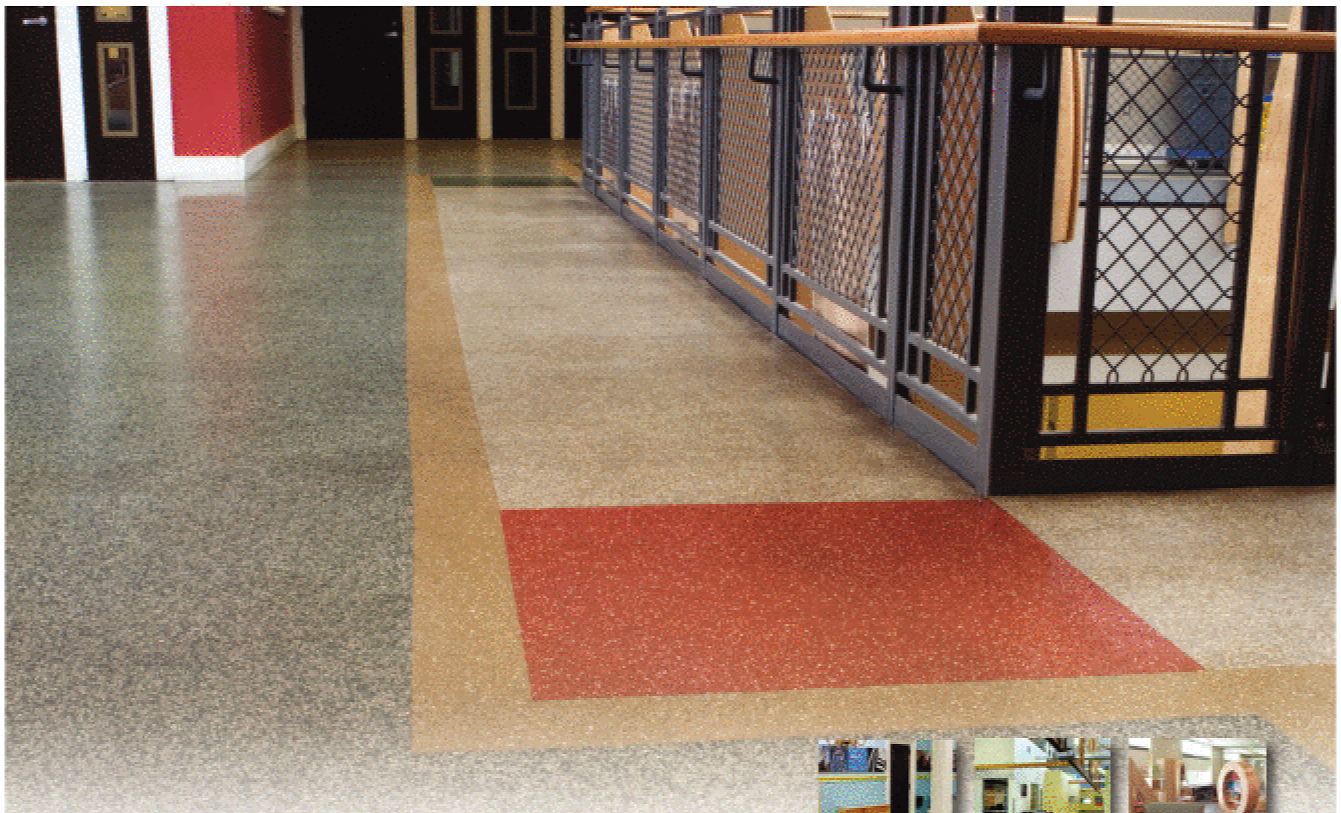

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Curb appeal

Aluminum composite material panels add aesthetic element to high school addition

The Metal Initiative. Until recently, the 22-acre campus of Mamaroneck High School, near New York City, consisted of the original 1926 building and a former junior high school situated about one-quarter mile away. The newest addition, a 28,000-square-foot, three-story facility, serves as a unifying element for what had been a highly segmented school complex for about 1,300 students.

Mamaroneck High School, Mamaroneck, N.Y.
Photo courtesy of Alcan Composites

About 10,000 square feet of 4mm Hartford green aluminum composite material (ACM) panels shaped as exterior stepped barrel cornice pieces and aluminum column covers contribute to the addition's curb appeal. The building projects straight stepped barrel cornice pieces, as well as a large, curved stepped barrel cornice with exacting radius conditions. The cornice measures 35 feet long by 30 inches high and has a 50-foot radius.

In selecting ACM panels for the cornices and column covers, Brian Snyder, project architect and senior associate at The Geddis Partnership, said the material offered more design flexibility and color options than glass fiber-reinforced concrete and other materials evaluated for the project. "We were working with a curved roof and needed a material that would lend itself to a curved profile," says Snyder. "ACMs are exceptionally versatile. They can be pattern-cut and rolled into any shape."

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Campus appearance matters

Students rank "campus appearance" as one of the top factors in choosing a college.*

* Based on 2007 research by Noel-Levitz, "Factors to Enroll" study of college students in four-year universities.

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Glass replacement

Sheffield Plastics Inc. MAKROLON 15 Polycarbonate Sheet, a glass-replacement product, offers exceptional weather ability with increased protection against tough environmental conditions and long-term UV exposure. It is lighter than glass and features insulation properties, making it a practical and cost-effective solution. It ensures product endurance with a 15-year limited warranty covering breakage, yellowing and coating integrity.

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Athletic equipment

Future Pro. The Easy-Up Youth Goal allows students to play basketball from the official 10-foot height to lower levels for younger students. The backboard goal combination can be installed by one person over any style or make of goal and backboard. No tools are required. Schools can choose a goal that is fixed at 8 feet, 8.5 feet or 9 feet in height, or an adjustable goal that raises and lowers from 6.5 feet to 9 feet. All goals have a 48-inch by 32-inch graphite backboard with a lifetime limited warranty.

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Online procurement

Interflex. Focused on K-12 school food service, BidAdvantage for Schools is an online competitive-bid system that streamlines the bid process and communications among food manufacturers, distributors and brokers. Schools can tabulate vendor quotes easily and award food-service bids, while meeting governmental regulations and eliminating time-consuming paperwork.

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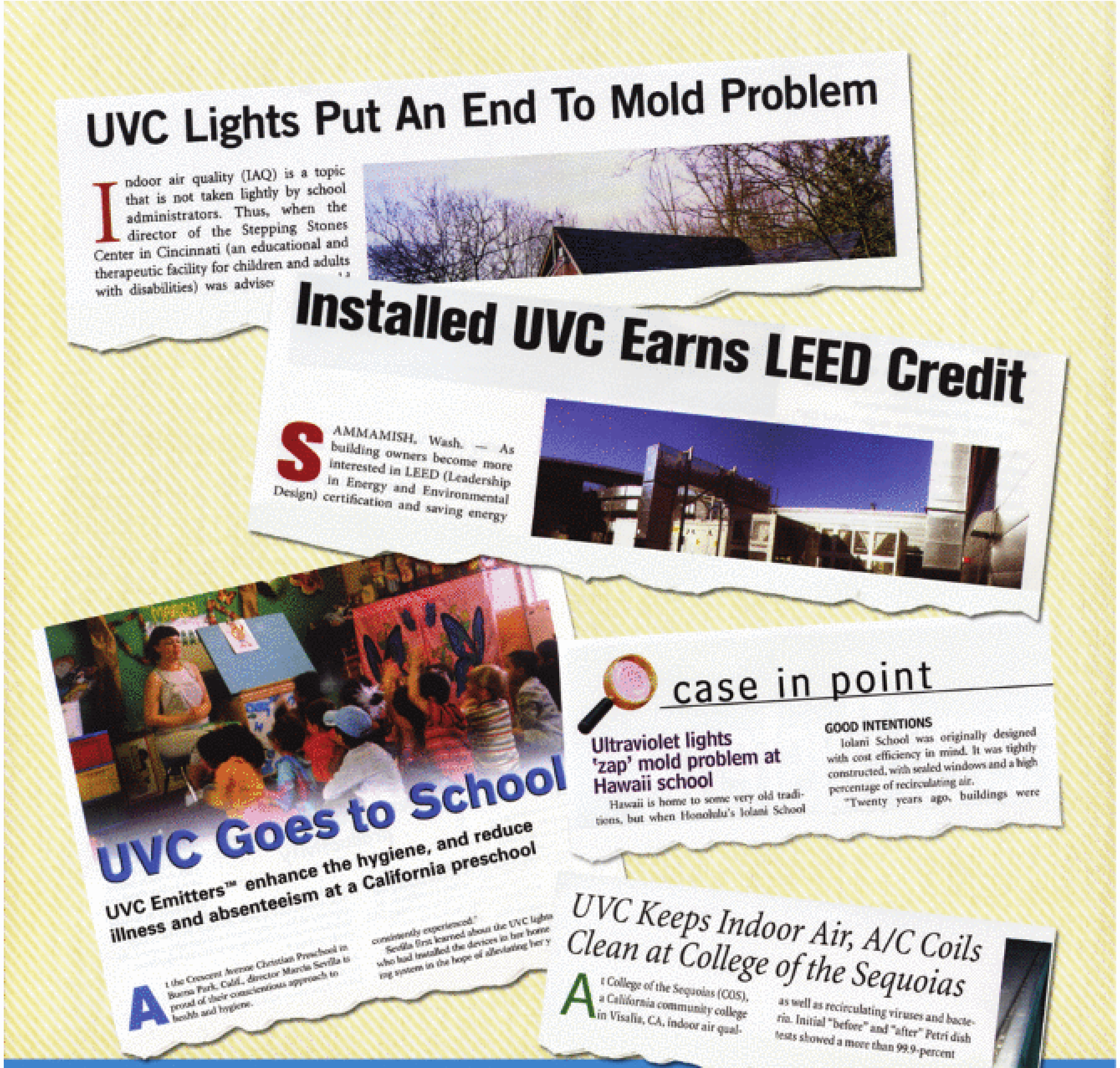

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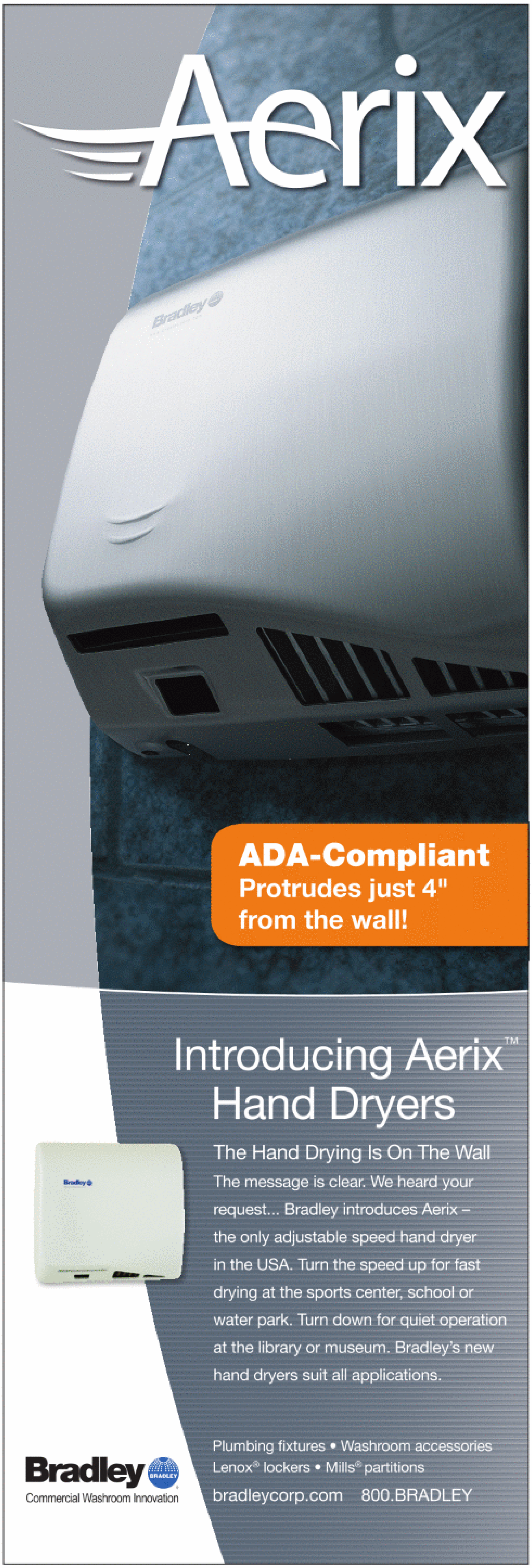

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Planning a payback

Heat mirror insulating glass saves high school 40 percent in annual energy costs

Southwall Technologies, Inc. Manheim Township High School, Lancaster, Pa., which consists of renovated and newly constructed buildings totaling 40,100 square feet, is expected to qualify for LEED silver certification, in part because of its extensive use of suspended-film insulating glass.

By using suspended-film insulating glass, project engineers were able to specify a smaller HVAC system, which provided considerable cost savings. Specifying suspended-film insulating glass cost the school about three times that of generic low-e glass, but saved 40 percent in annual energy costs. The payback is 11.5 years. Factoring in a $90,000 savings by being able to specify a smaller HVAC system reduces the payback to 6.5 years.

The thermal and solar shading performance of suspended-film insulating glass enables glazing solutions that can achieve up to 21 LEED credits, or 54 percent and 40 percent of the total required credits for gold and platinum certification, respectively.

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Manheim Township High School rendering, Lancaster, Pa.

Sustainable lighting

Litecontrol. Litecontrol offers lighting systems to address the qualitative visual needs of students and teachers while minimizing the impact on the environment. The SAE 7700 and the Radi-X fixture provide efficiency and comfort for sustainable classroom lighting. The SAE 7700 complements the existing SAE 9700 and 9800 fixture families with its highly efficient optics and open steel baffle design. The Radi-X uses LiteCycle resin, a new baffle material to maximize visual comfort for students and teachers.

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Bus tracking

Seon Design Inc. vMax with Tracking is a simple, reliable and cost-effective solution to the operational and financial challenges facing transportation managers in education institutions. User-friendly software displays the exact location of buses on a map, including the street name and time. The maps are displayed on a separate screen apart from the multiple-view camera channel window, allowing the user to view larger images of the maps. On video playback, these dual screens are synchronized completely.

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Steel curtainwall

Technical Glass Products. Steel-Built Curtainwall Systems allow larger areas of glass, smaller frame profiles and wider free-spans than is possible with aluminum framing. The Infinity Series takes design flexibility even further with back mullions of almost any profile, including I-, T-, U and L-shapes, and can use almost any type of framing member as a back mullion, from stainless steel to glulam beams.

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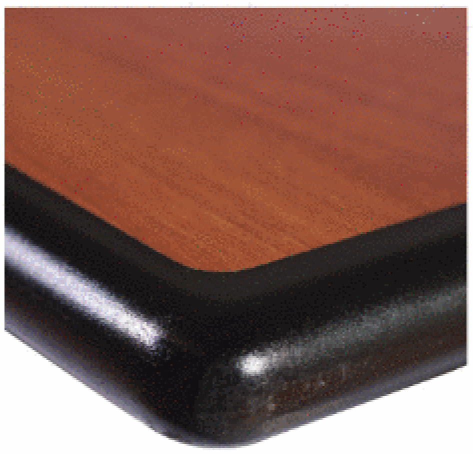

Table edging

PS Furniture/Palmer Snyder. MAXX Edge is not a separate component, such as traditional vinyl "T" edging or metal edging. Rather, it bonds to and becomes part of the tabletop. Because it eliminates gaps, the end result is no space for food particles or other bacterial substrates to collect, making for a more hygienic table.

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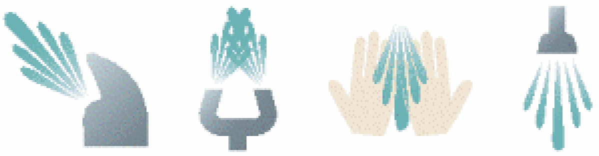

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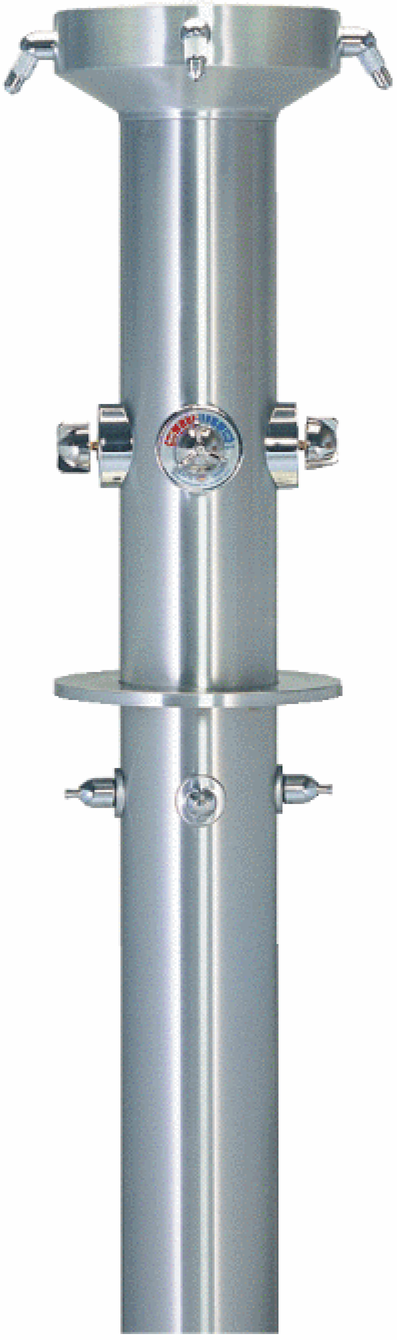

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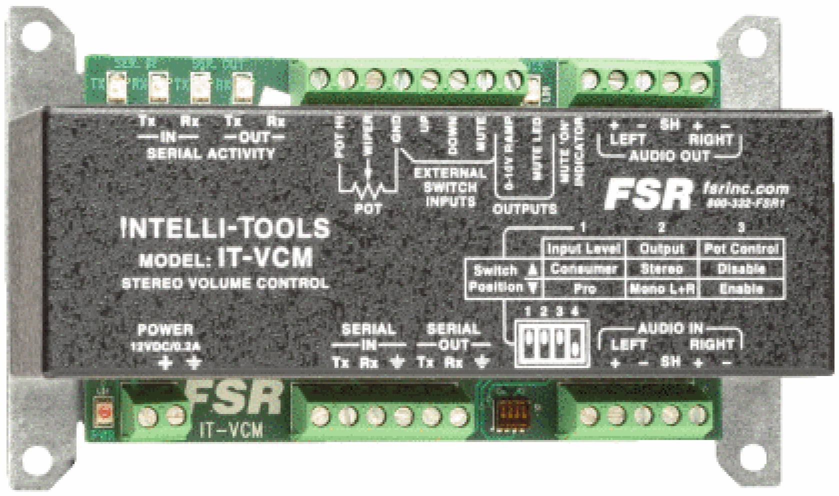

Volume control

FSR. The IT-VCM is a stereo or mono line level volume control module that accepts a balanced or unbalanced stereo audio line level source and provides a balanced stereo output. The module responds to RS-232 commands and manual controls including volume up/down ramping, audio levels and more. Additional IT-VCM modules can be daisy-chained to control multiple sources.

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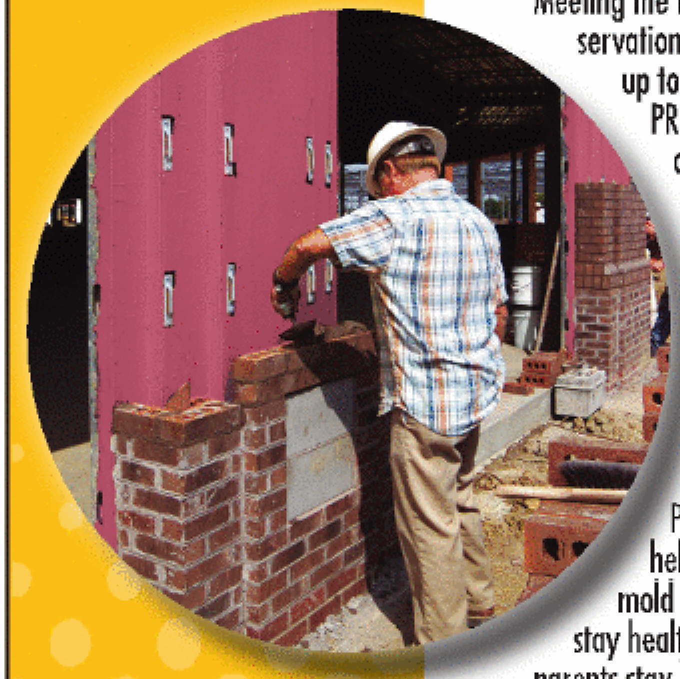

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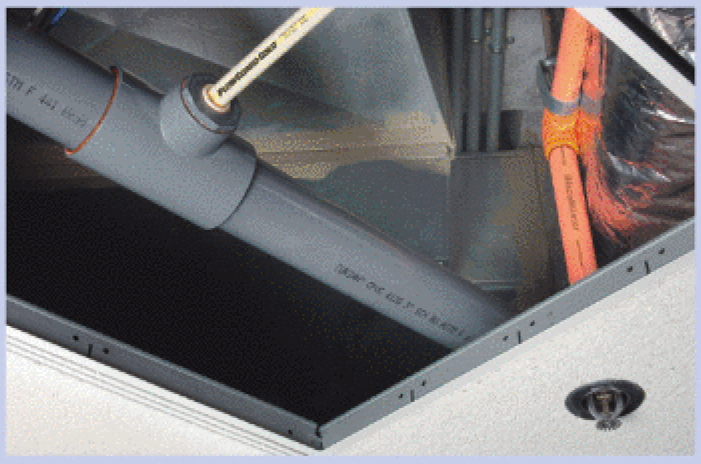
Time crunch

Solvent cement joining system for plumbing in new residence halls saves labor costs and keeps project on schedule



The University of Massachusetts Dartmouth.

Lubrizol Advanced Materials. To accommodate a projected 3,900 additional students, The University of Massachusetts Dartmouth, part of a five-campus system, launched a massive project to construct six new residence halls in less than eight months.

Each of the six buildings houses 239 bathrooms—a total of 1,434. The plumbing portion of the project alone was estimated at $11 million, and between 80 and 100 union plumbers were required on the job site working together to meet the tight completion deadlines. The contractors assigned to the job knew that copper pipe was not an option because it requires more time and labor for installation.

The plumbers used Corzan CPVC pipe and fittings for the mains and risers in 2½-inch, 3-inch and 4-inch sizes. FlowGuard Gold CPVC pipe and fittings were used for the branch lines leading to the individual residence hall rooms. The labor savings realized by using Corzan and FlowGuard Gold CPVC pipe and fittings resulted primarily from the solvent cement joining system, which eliminates the need for soldering. Installation and cleanup are fast and easy.

Additionally, FlowGuard Gold and Corzan CPVC pipe provide superior thermal properties, translating into improved energy efficiency and less condensation. Both also provide a quieter plumbing system. Equally important, neither FlowGuard Gold nor Corzan CPVC pipe will pit, scale or corrode. This minimizes maintenance concerns, increases system service life, and enhances performance reliability.

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Efficient operations

Equipment upgrades and conservation strategies result in million-dollar savings

Johnson Controls. The Oklahoma State University (OSU) Center for Veterinary Health Sciences (CVHS), Stillwater, sought ways to optimize energy use and decrease its monthly energy spending. It worked with Johnson Controls to assess facility conditions and identify areas that could operate more efficiently.

The university used capital-planning management software to maintain data and forecast long-term spending. The result was a 20-year performance contract, which enabled OSU to fund the facility upgrades with the expected energy savings they would experience over the course of the contract that amounted to more than $9 million.

The Oklahoma State University Center for Veterinary Health Sciences, Stillwater, Okla. Photo courtesy of OSU

Facility improvements included replacing inefficient heating and air-conditioning units, installing occupancy sensors and high-efficiency windows, and retrofitting plumbing equipment to optimize water use. Based on a utility bill comparison, the project already has delivered more than $154,000 in operational savings during the installation period.

"Even before we had all of our systems operational, we could see our utility bills decreasing," says Michael Lorenz, dean of the CVHS.

In less than two years, the amount of energy saved by the project equaled what would be consumed by 175 single-family homes. The amount of water conserved could fill 18 Olympic-sized swimming pools.

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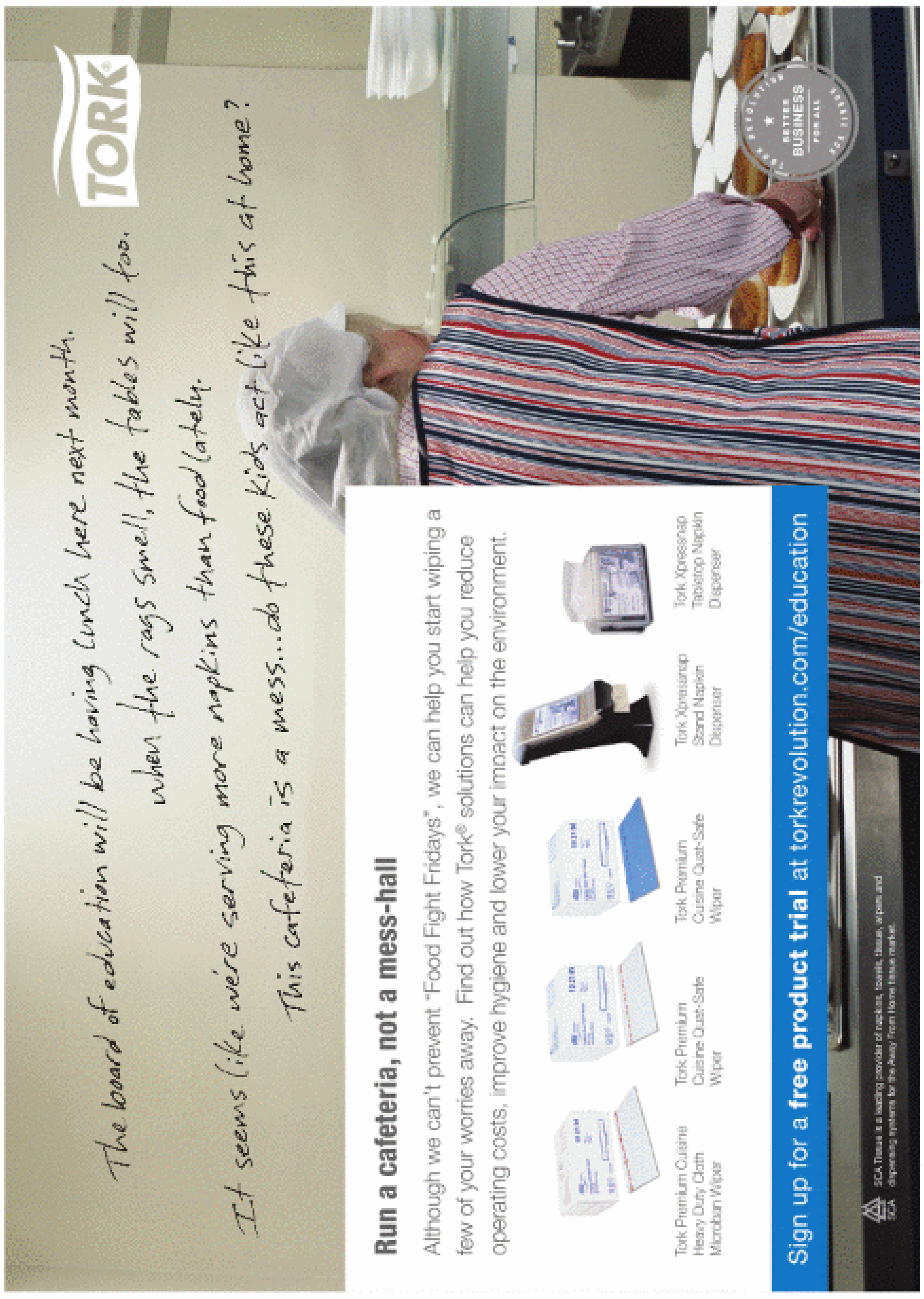

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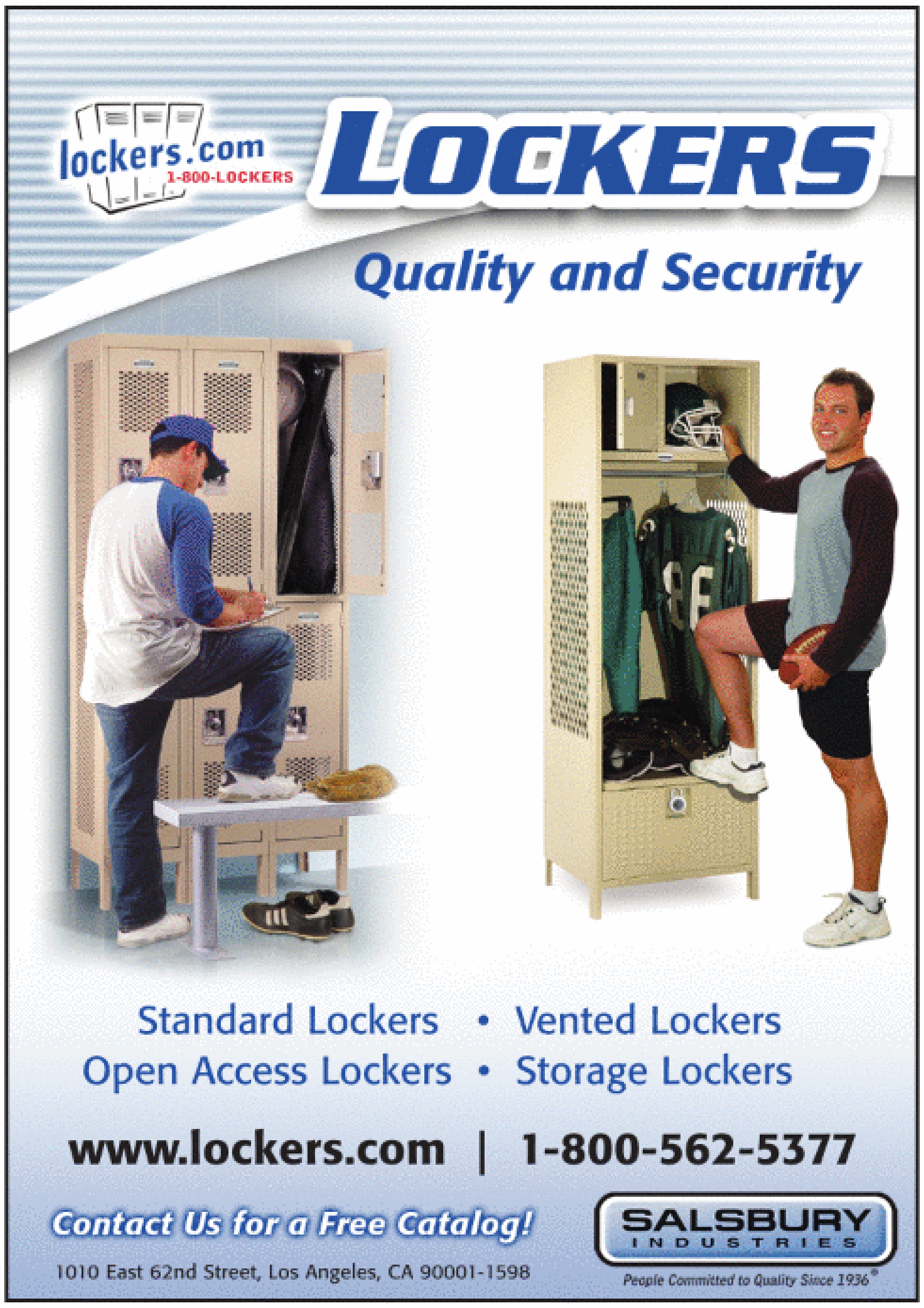

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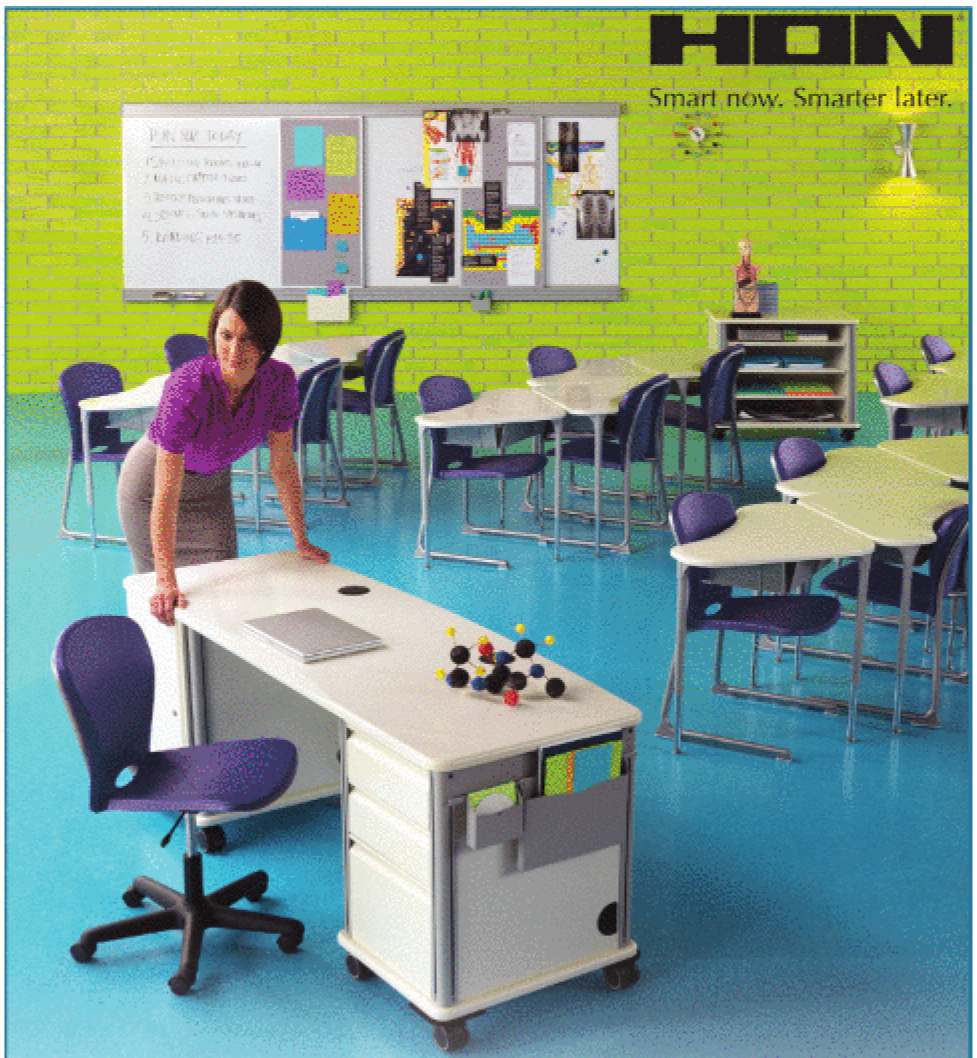

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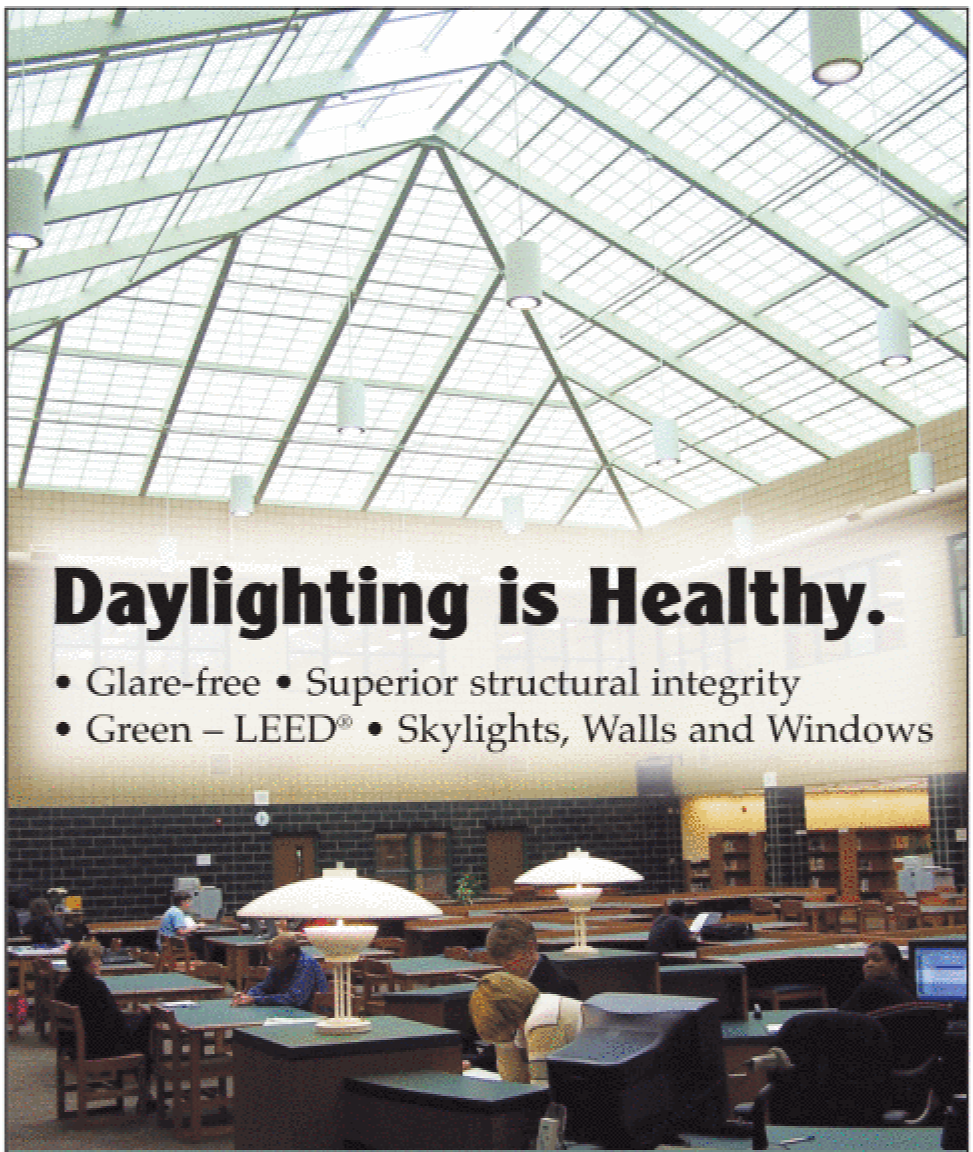

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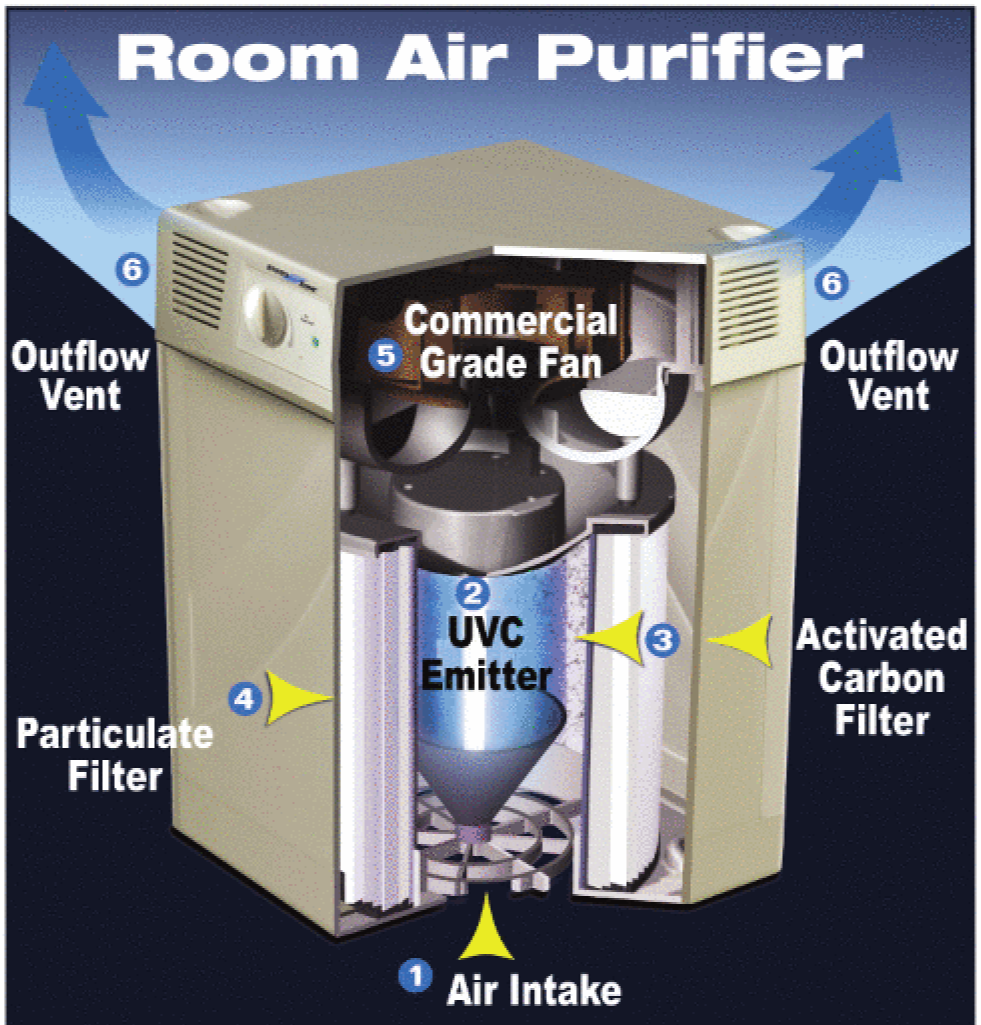

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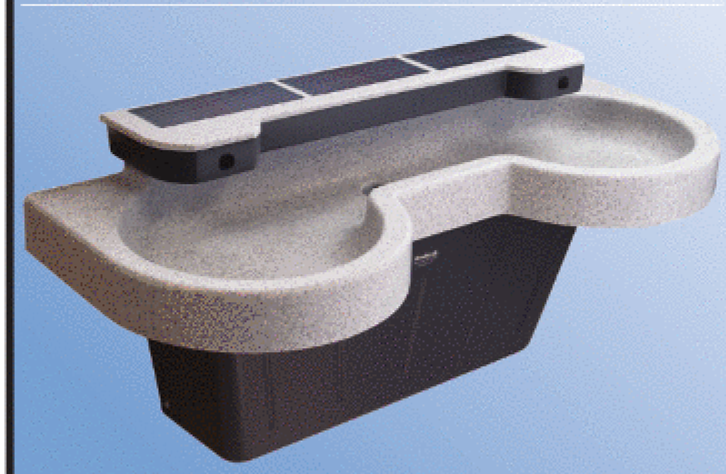

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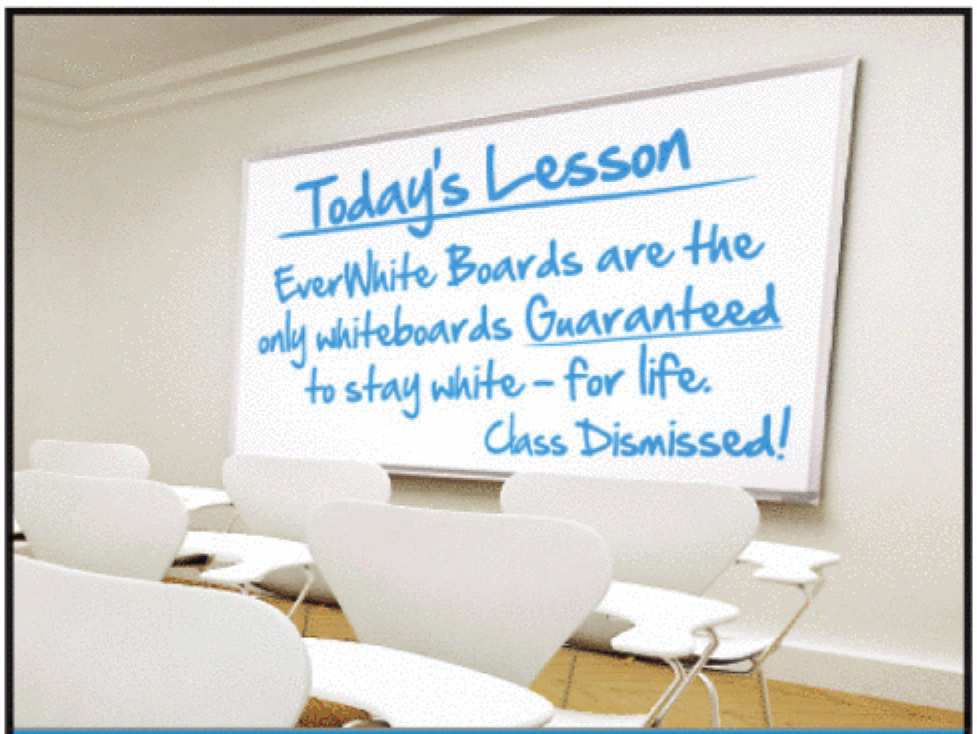

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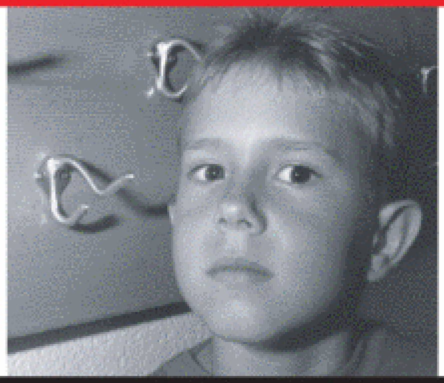

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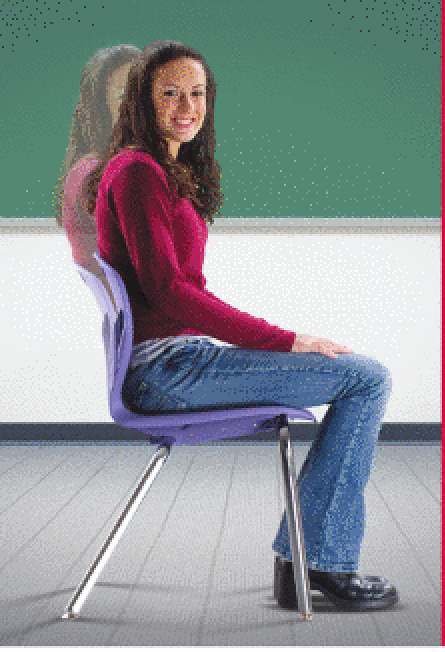

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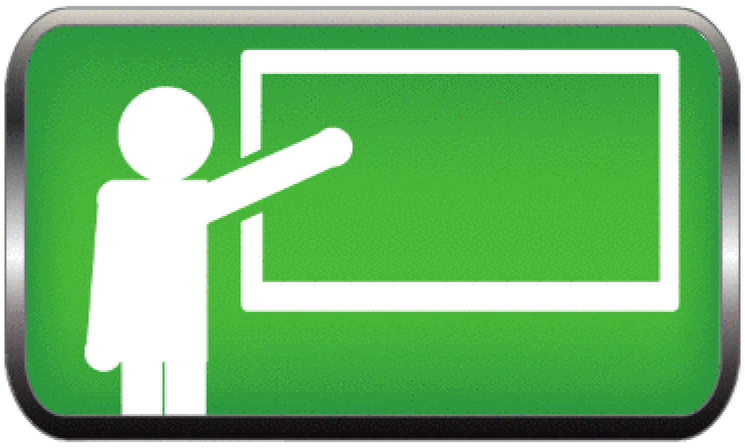

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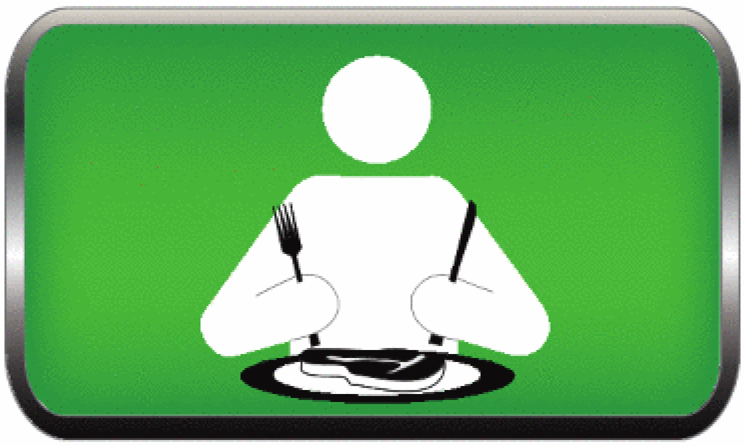

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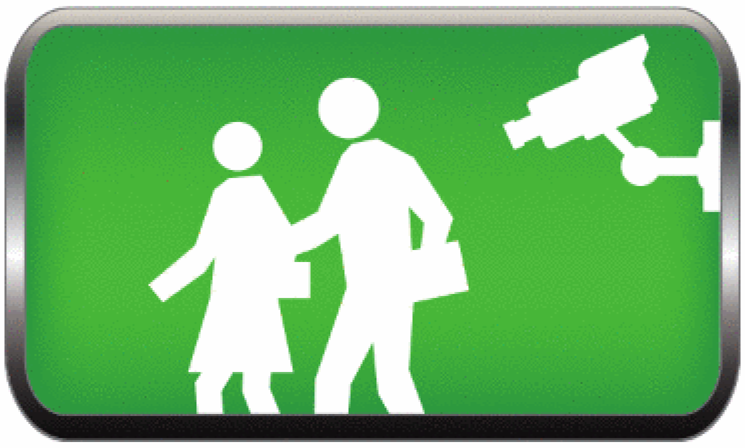

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